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THE IRON AGE

A Review of the Hardware, Iron and

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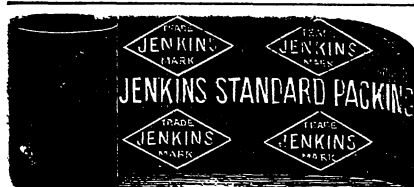
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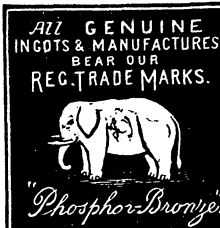
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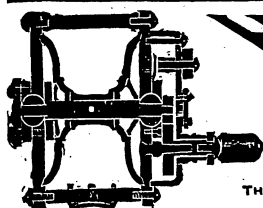
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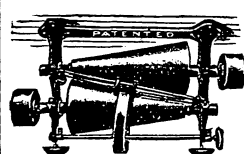
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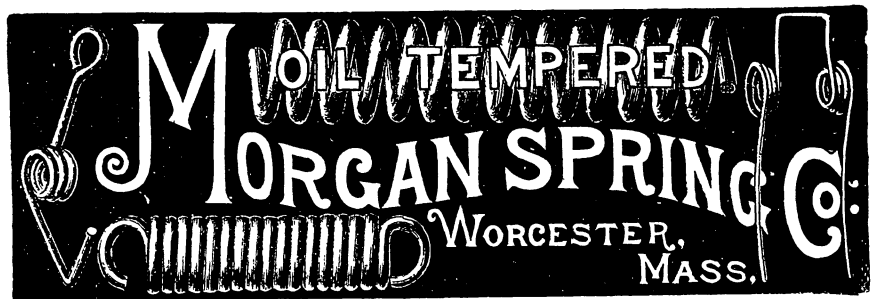
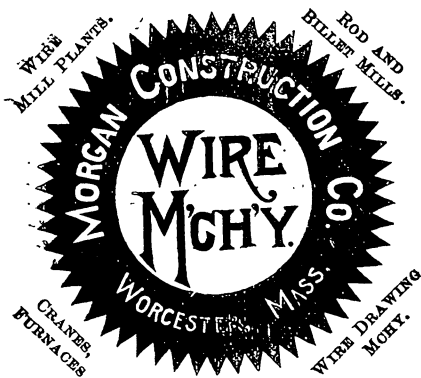
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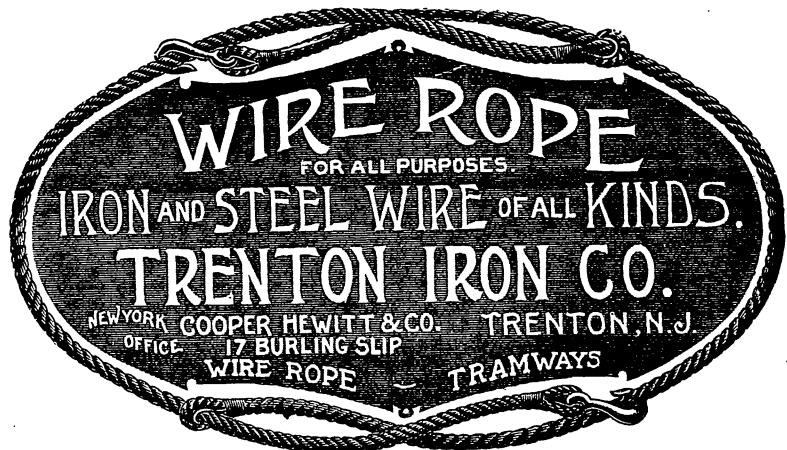
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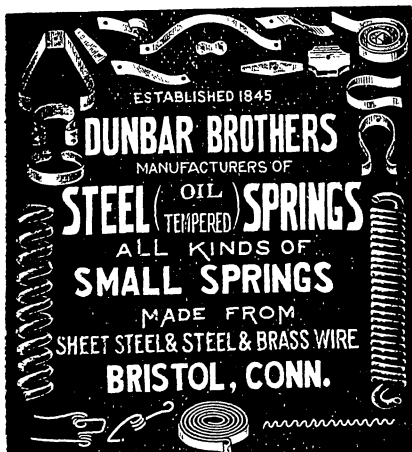


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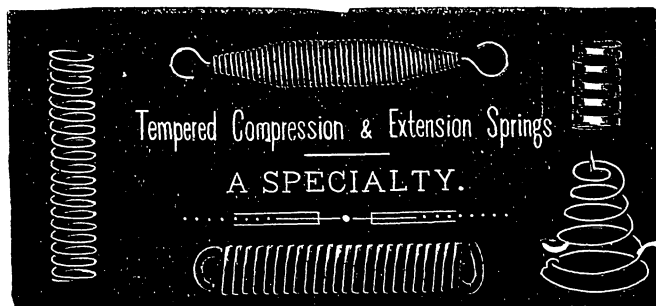


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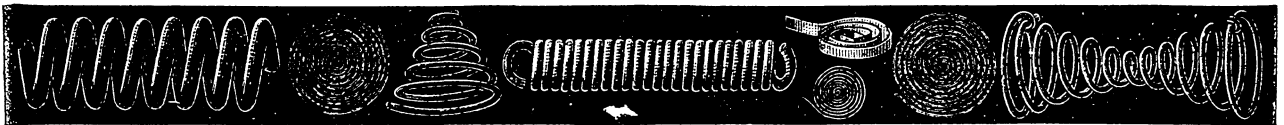
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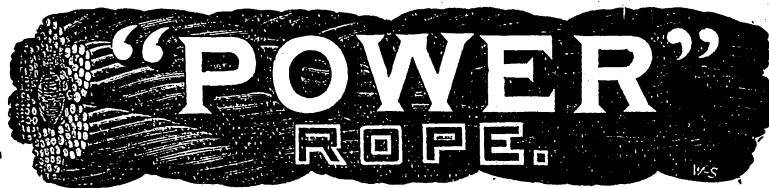
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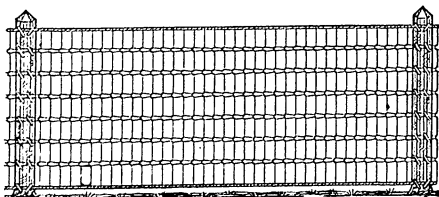
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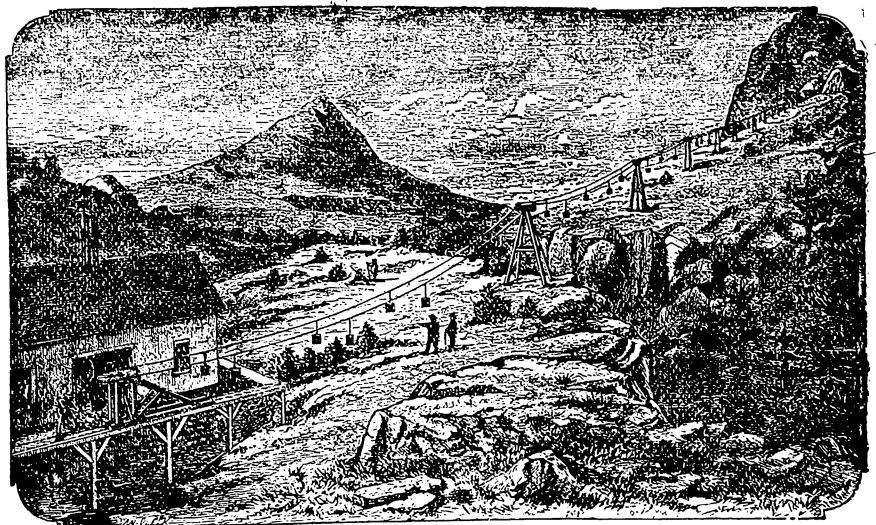
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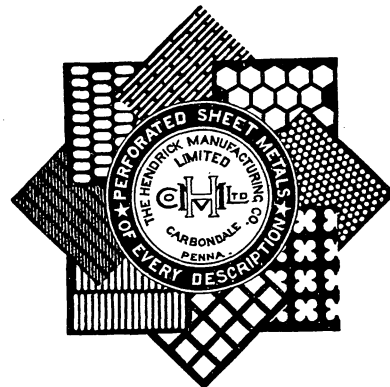


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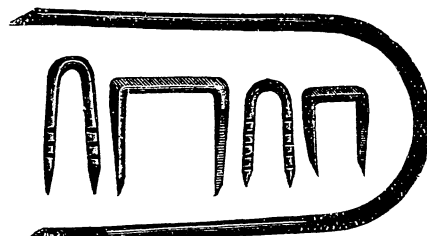
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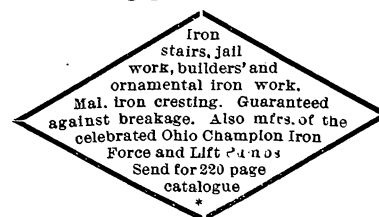
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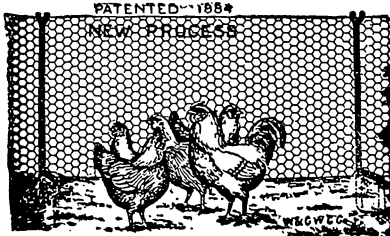
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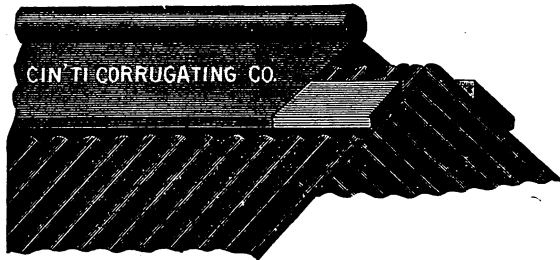
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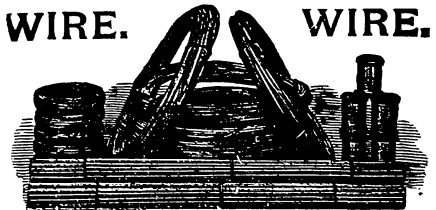
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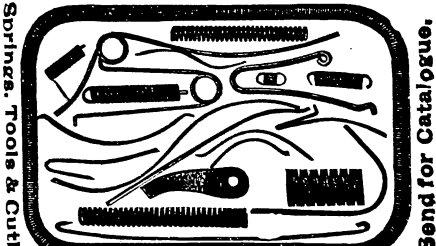
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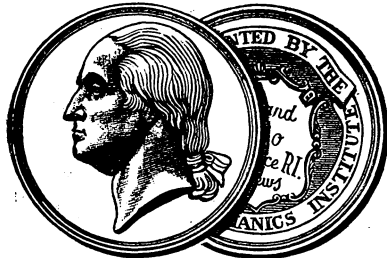
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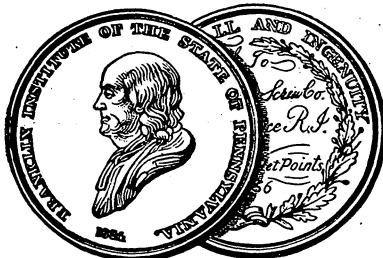
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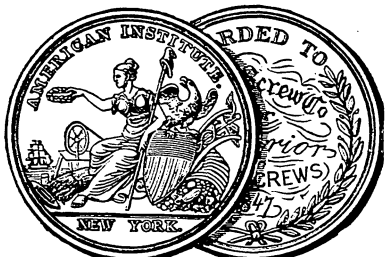
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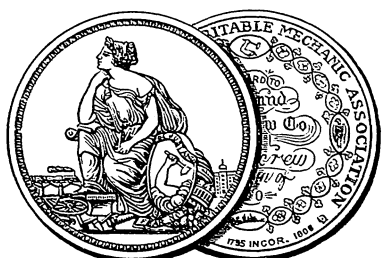
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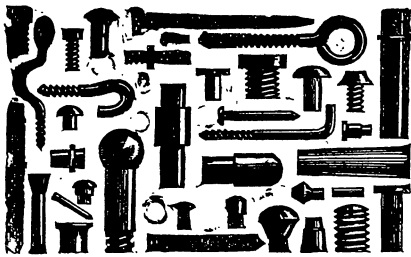
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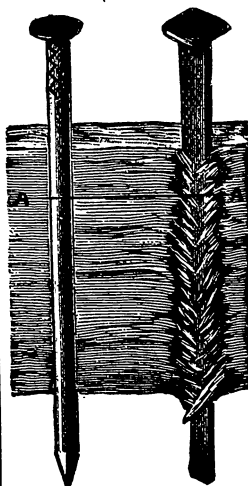
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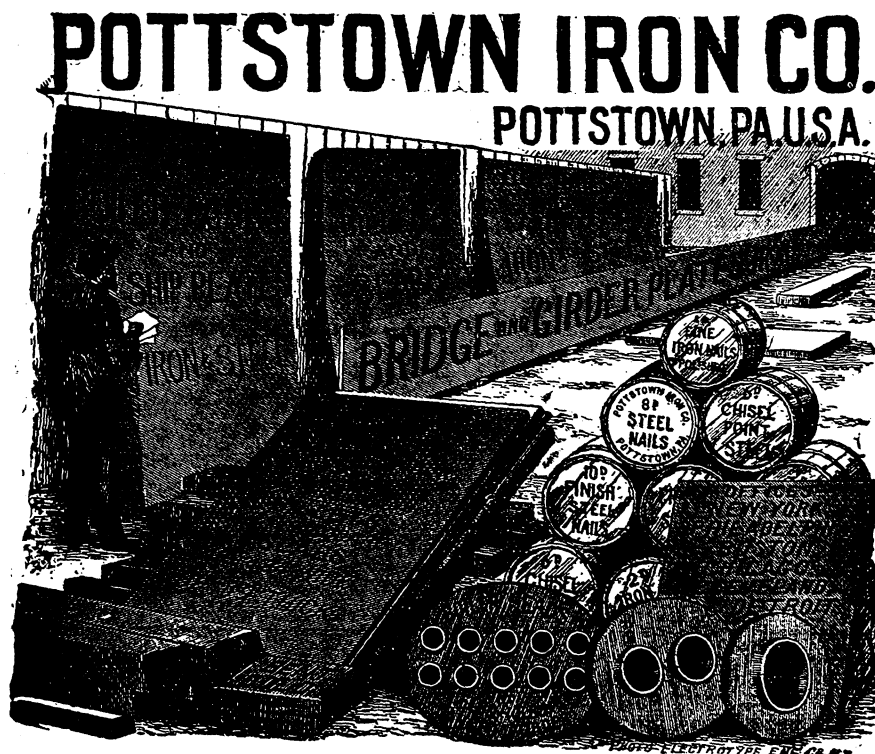
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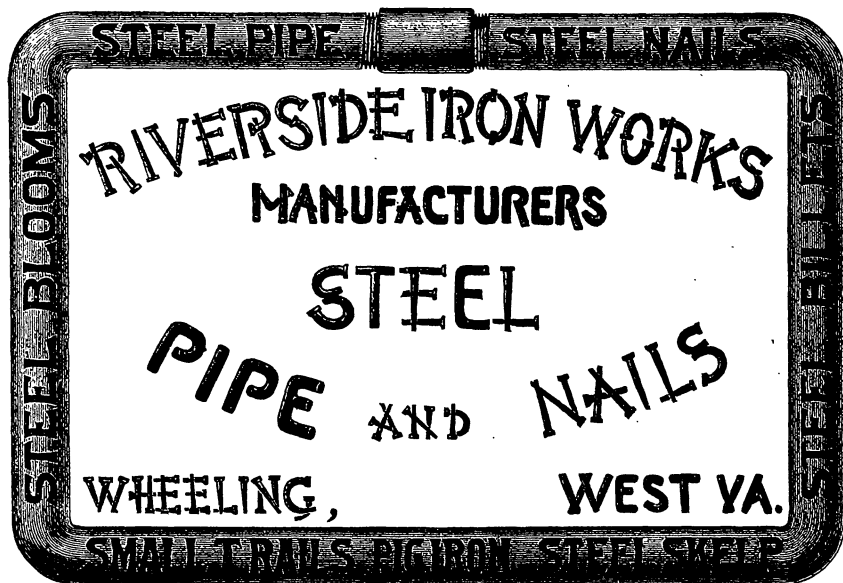
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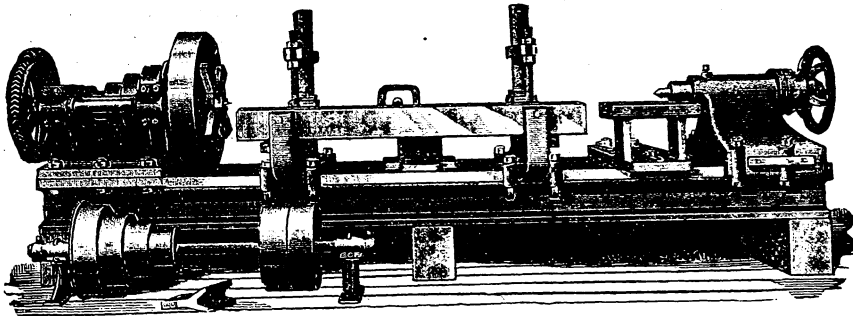
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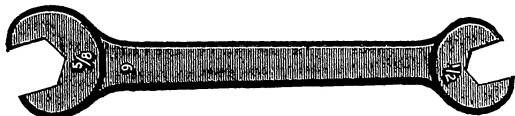
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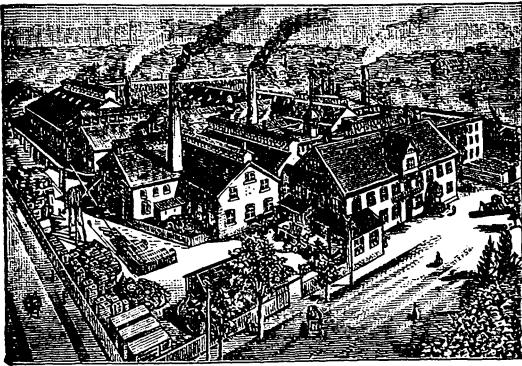
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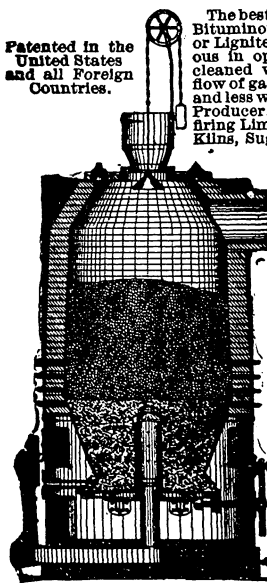
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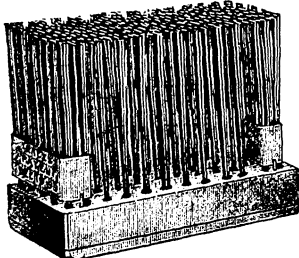
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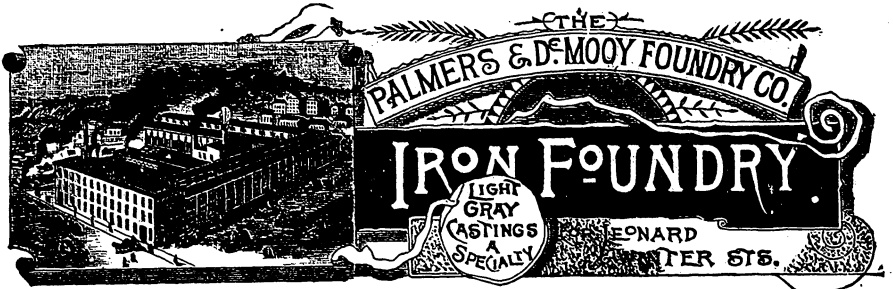
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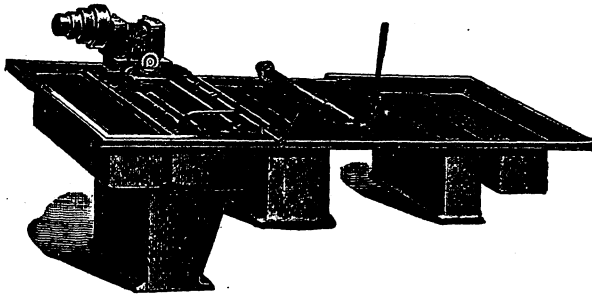
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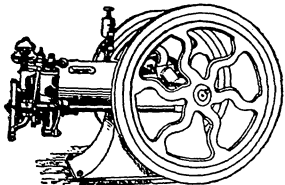
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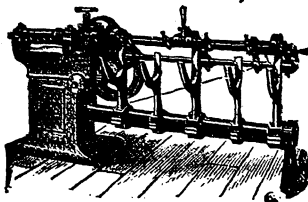
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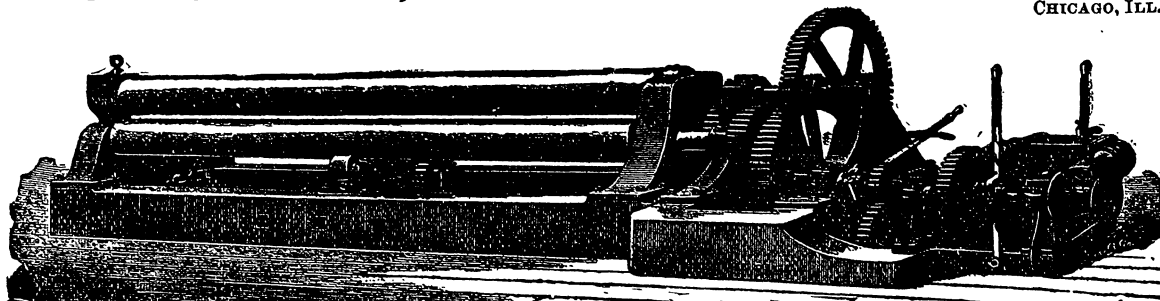
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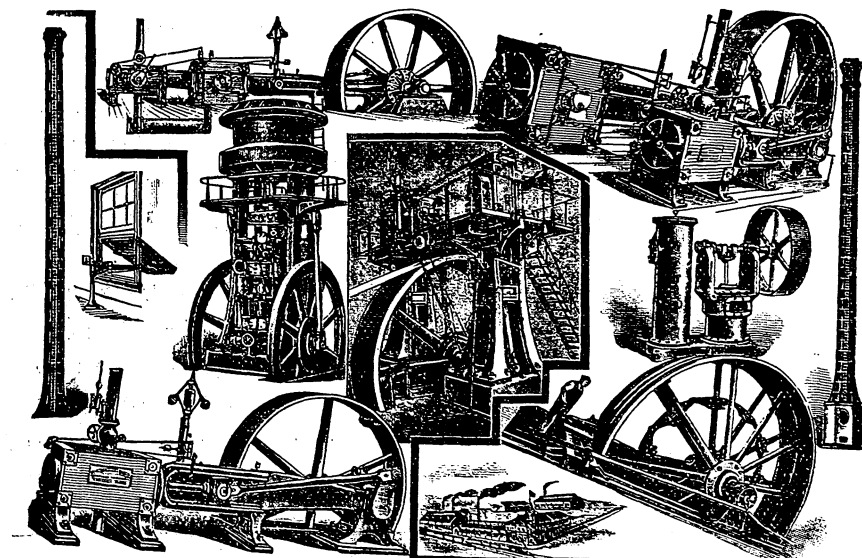
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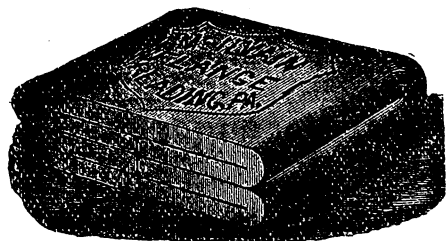
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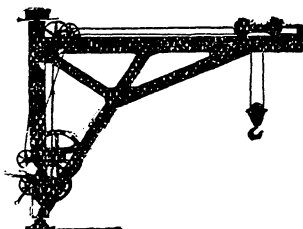
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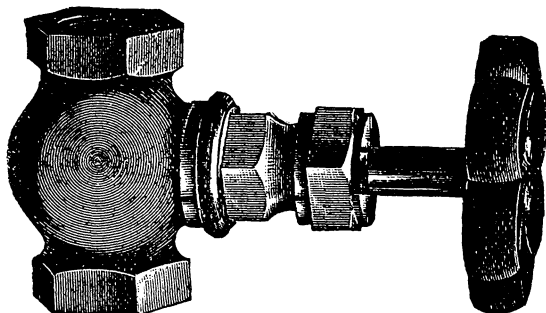
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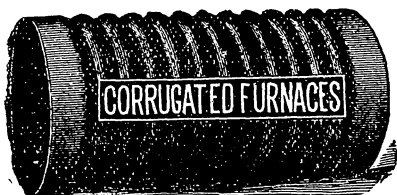
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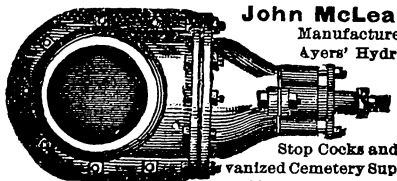
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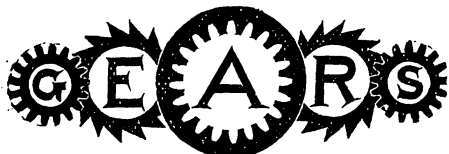
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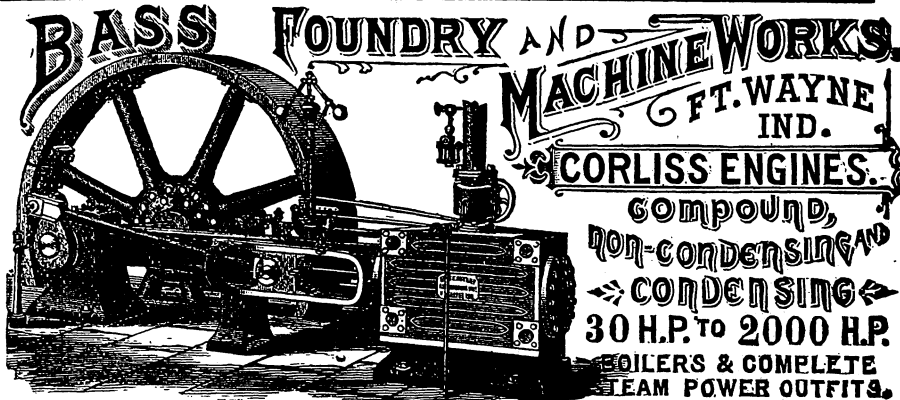


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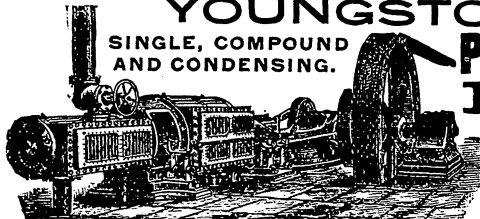
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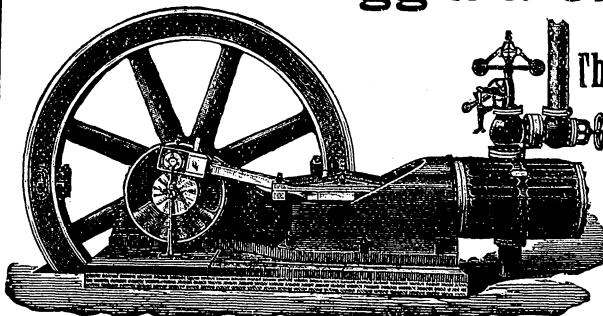


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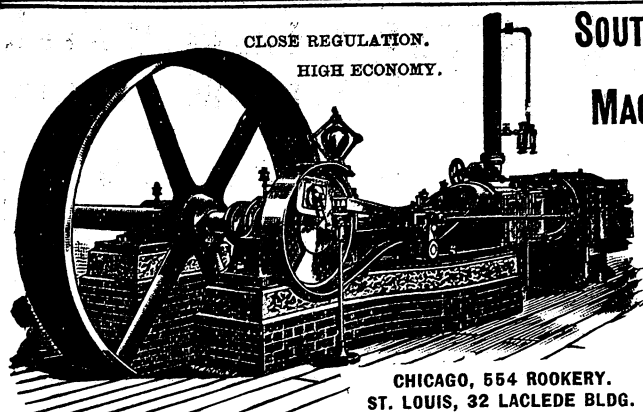
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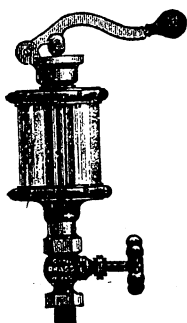
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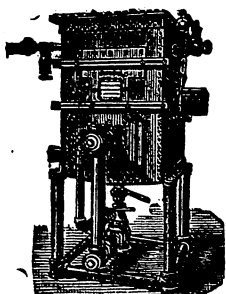
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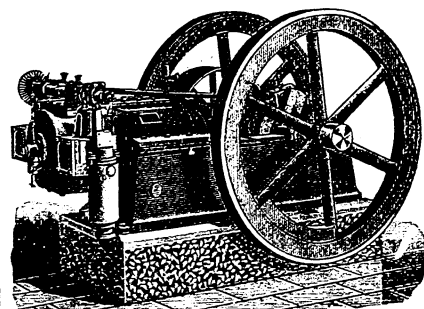
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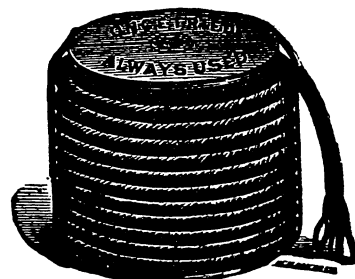
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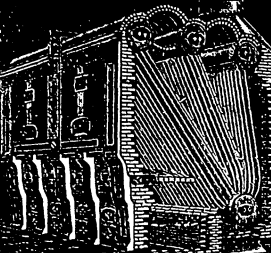
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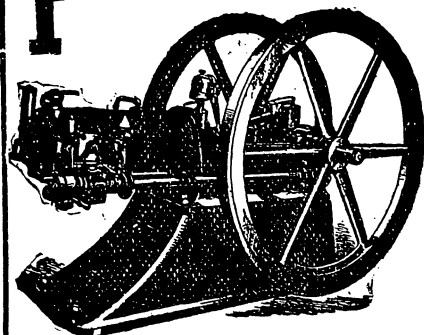
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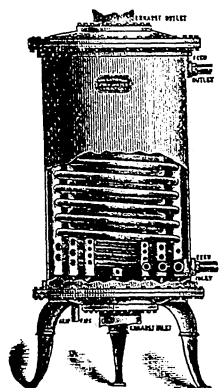
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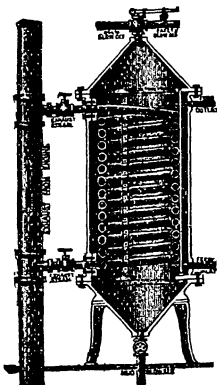
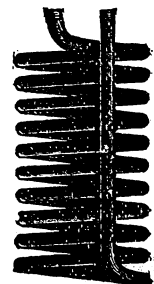


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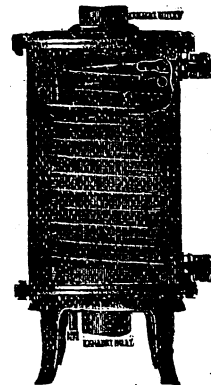
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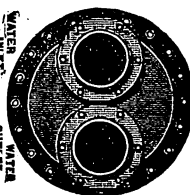
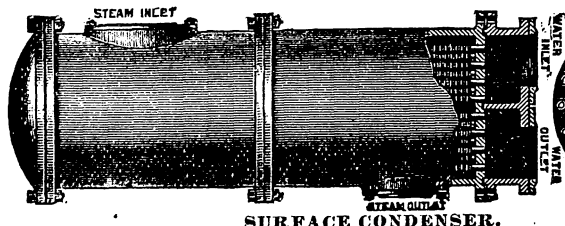
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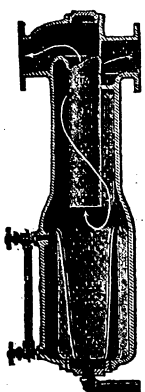
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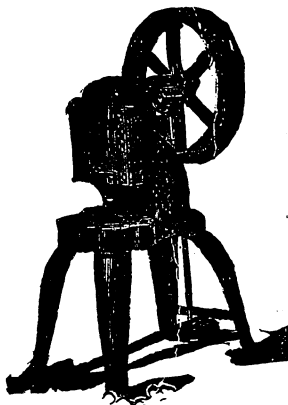
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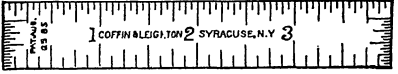


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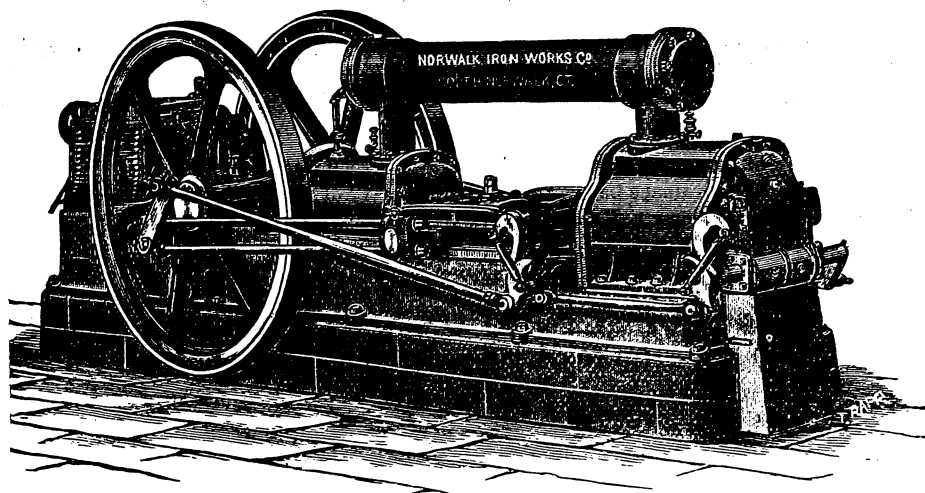
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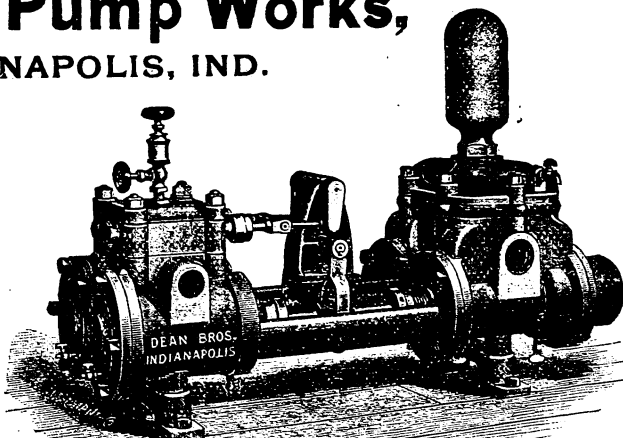
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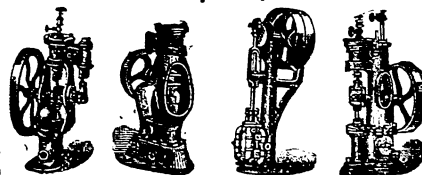
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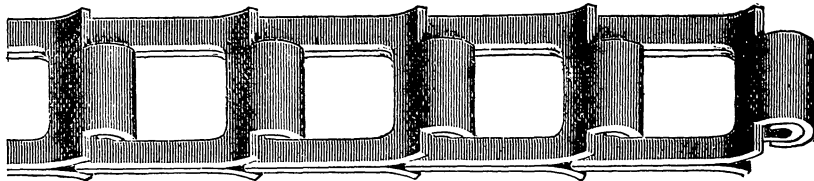
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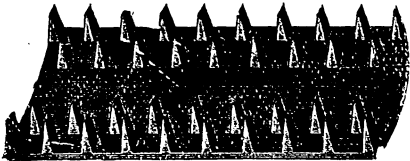


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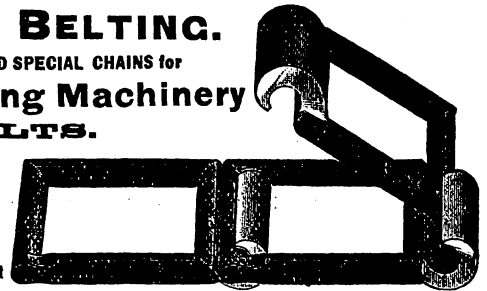
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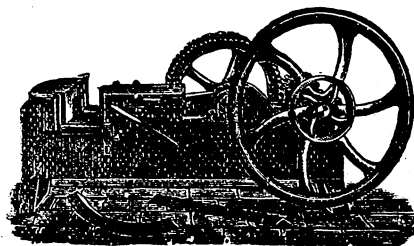
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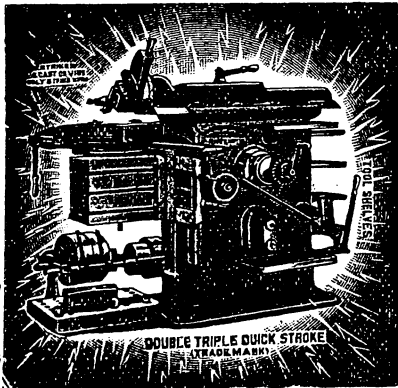
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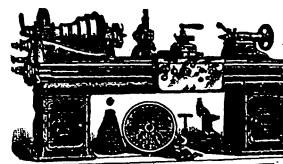
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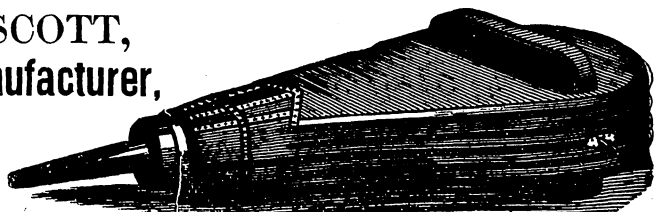
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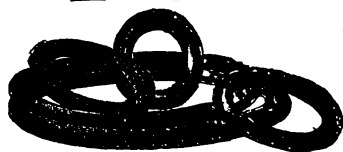
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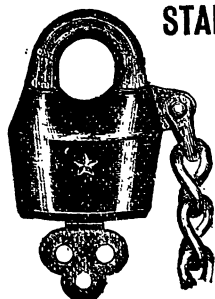


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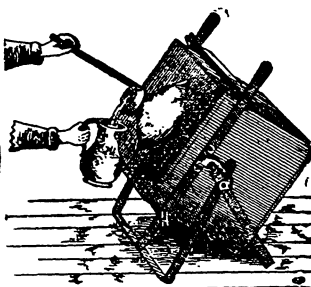
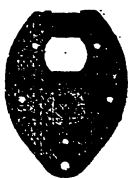
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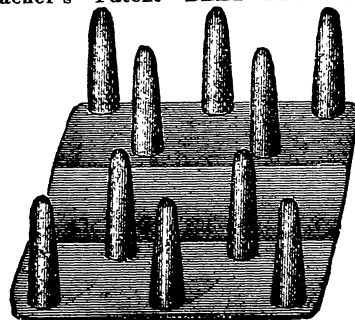
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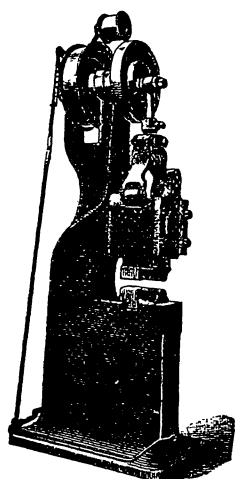
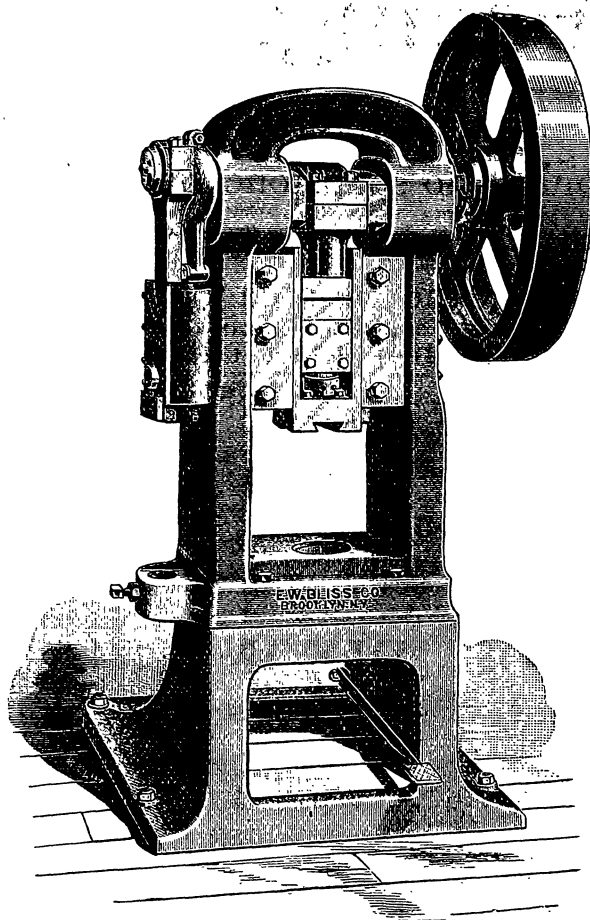
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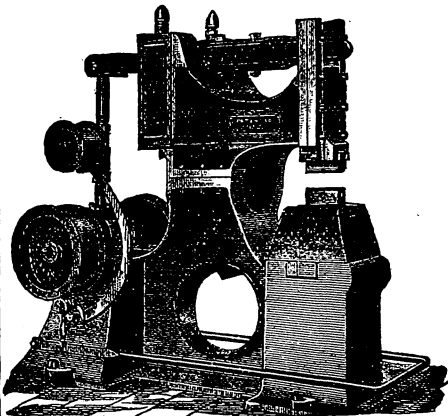
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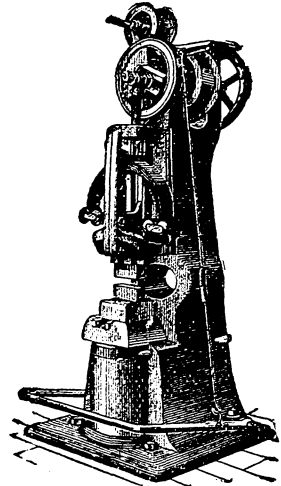
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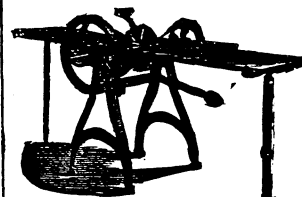
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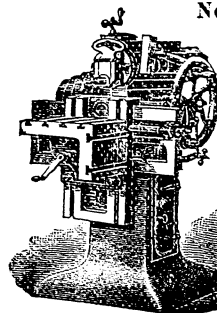
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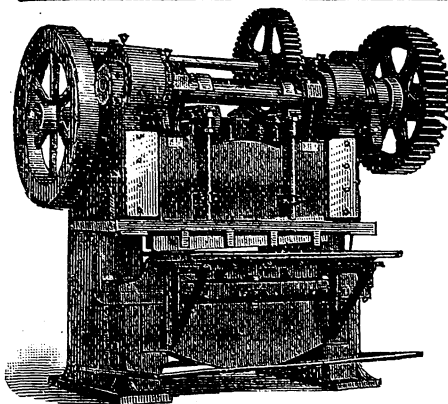
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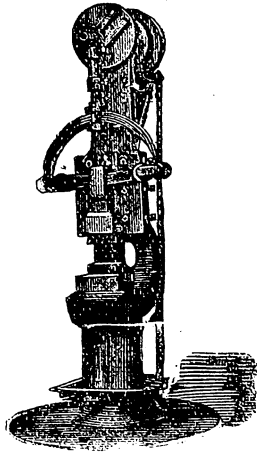
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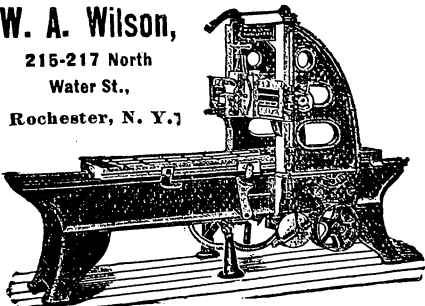
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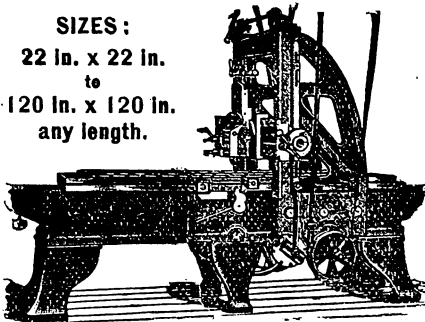
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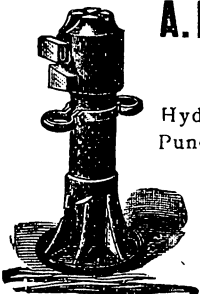
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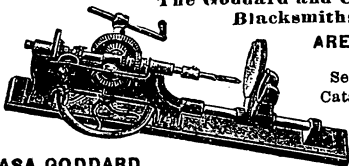
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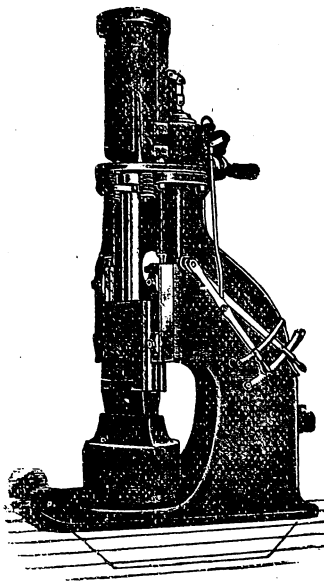
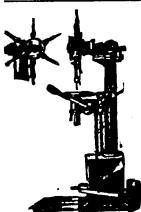
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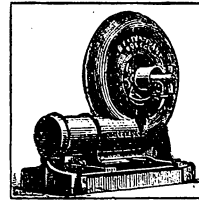
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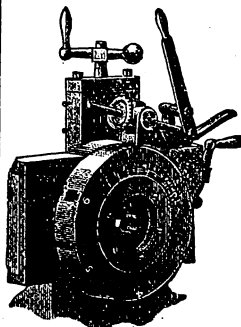
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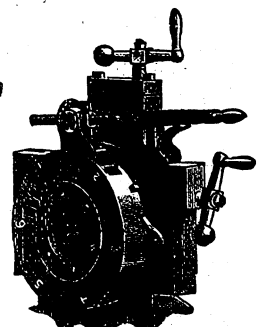
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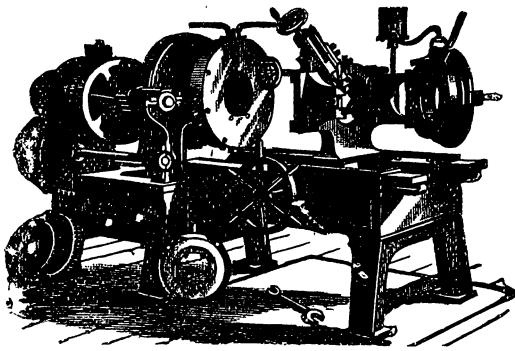
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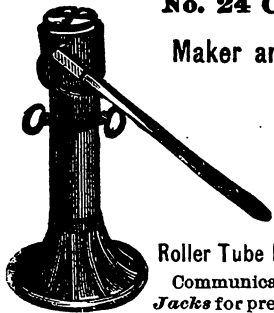
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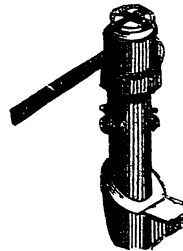
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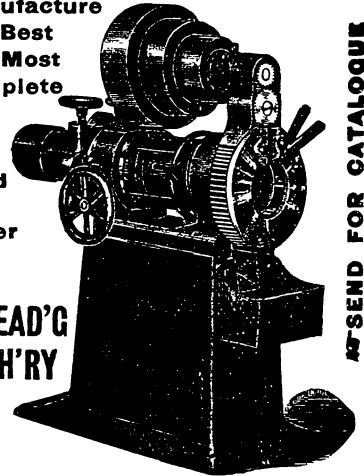


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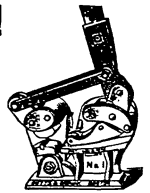
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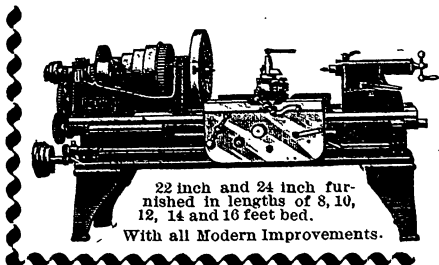
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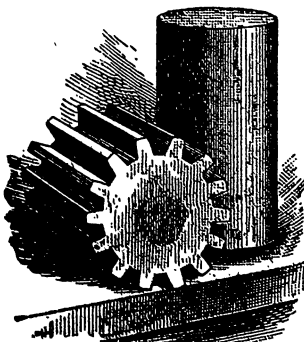
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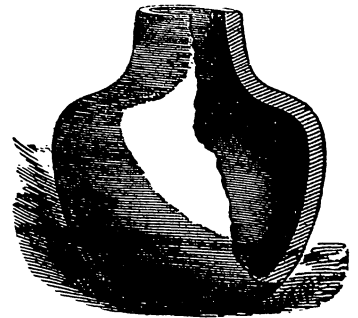


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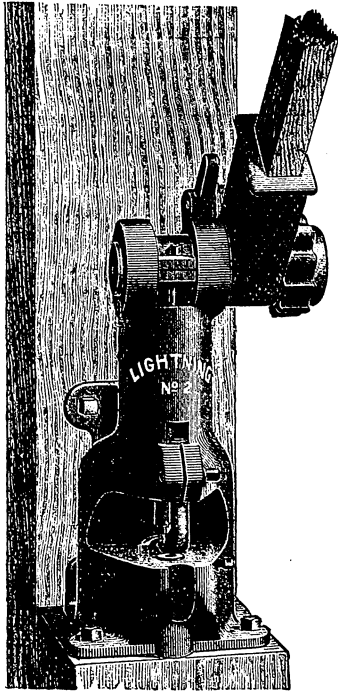


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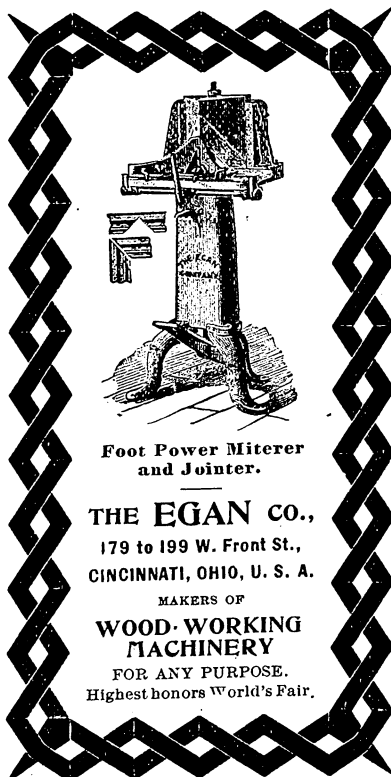


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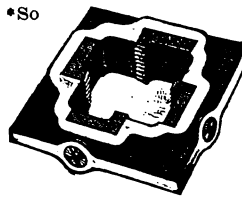
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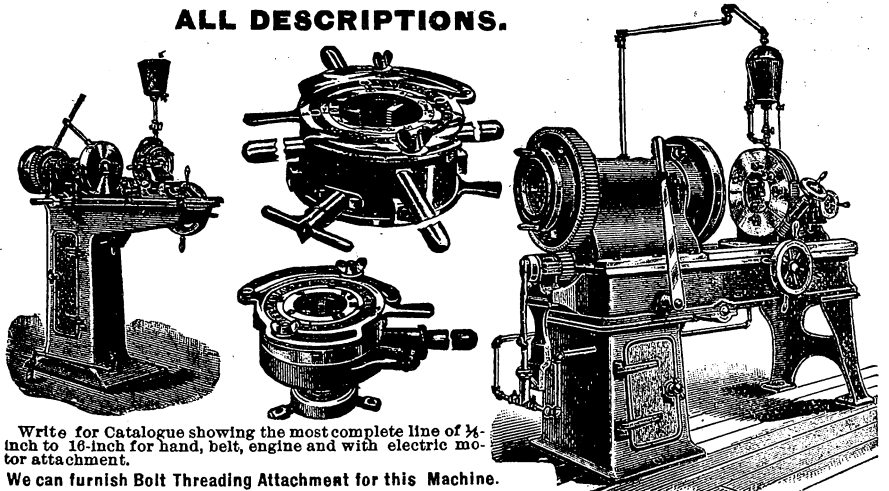
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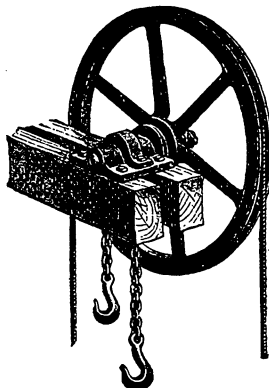
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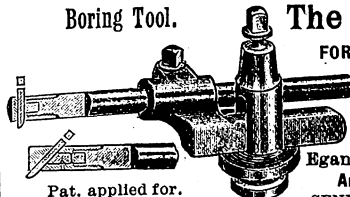
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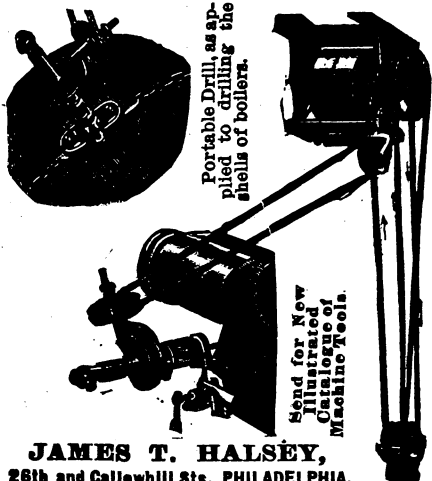
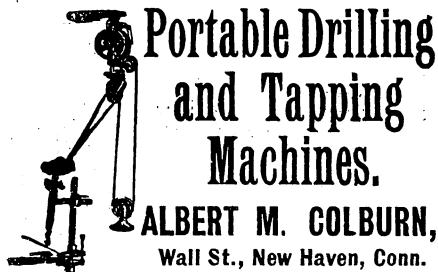
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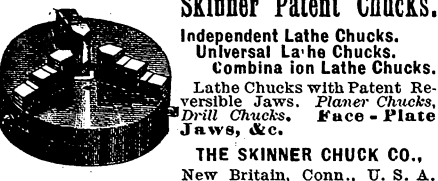
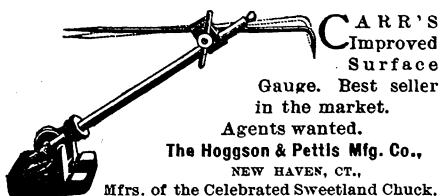
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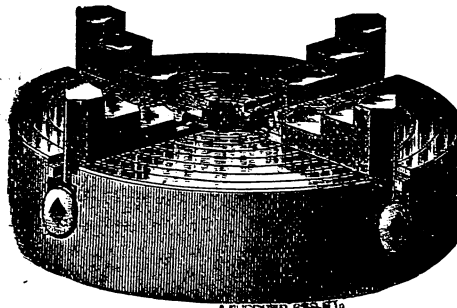
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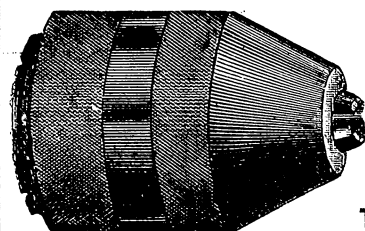
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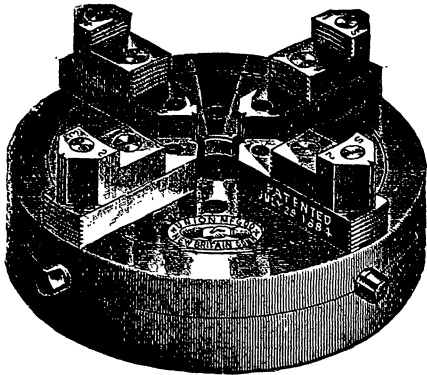
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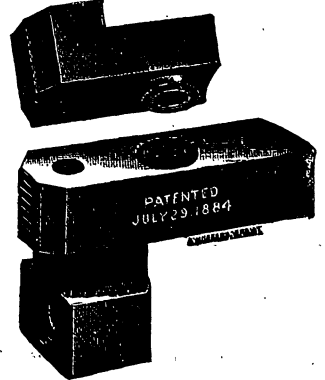
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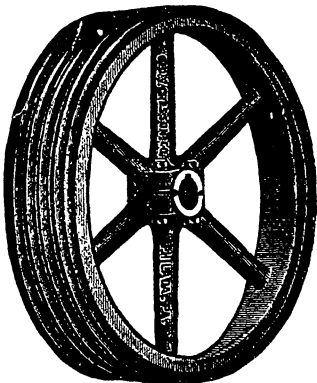
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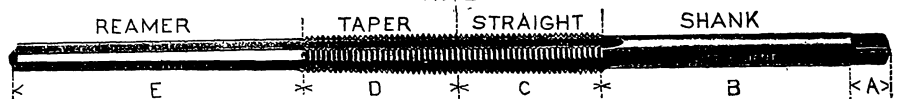
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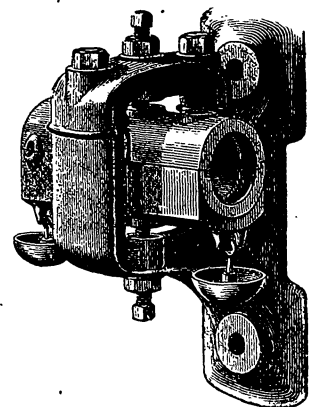
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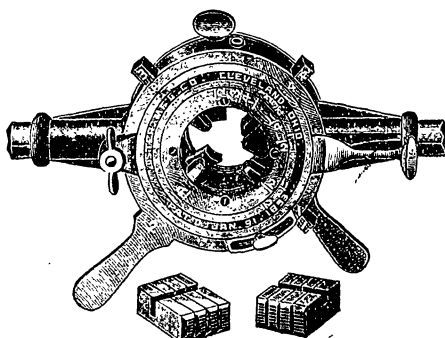
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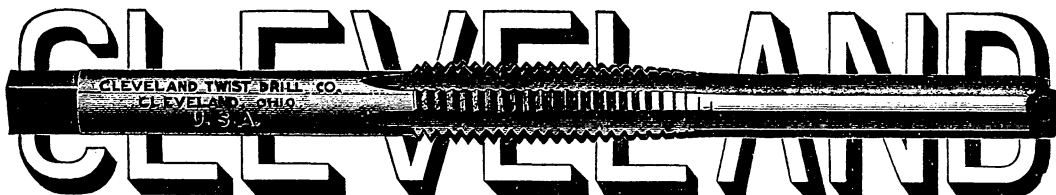
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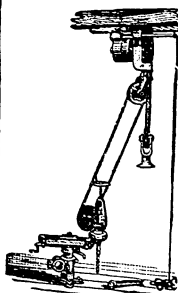
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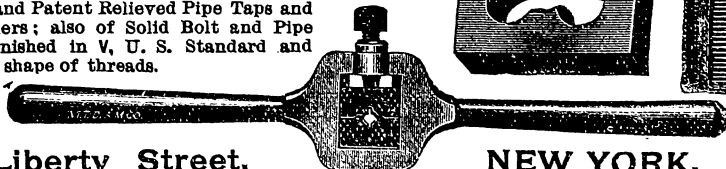
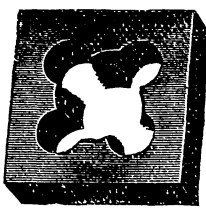
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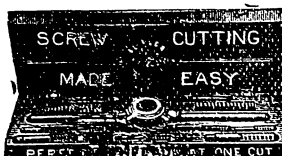
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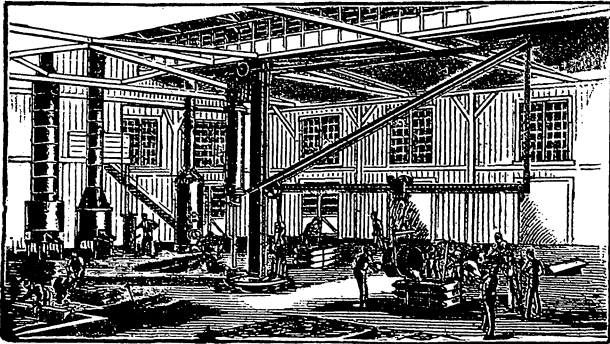
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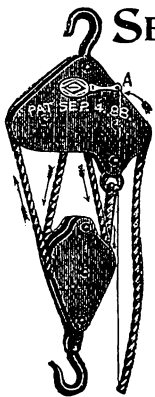
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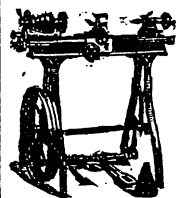
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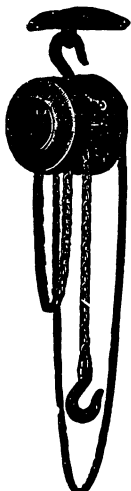
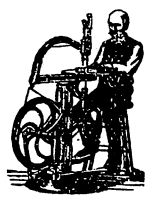
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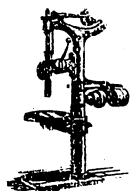
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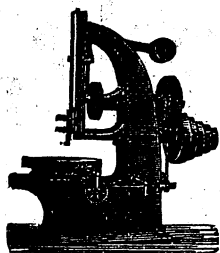
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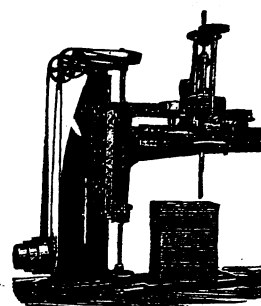


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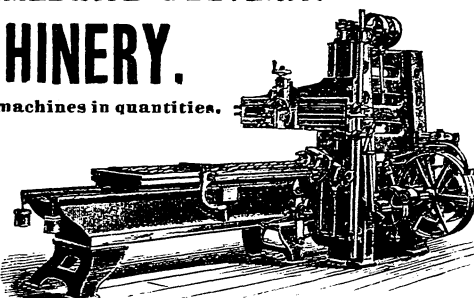
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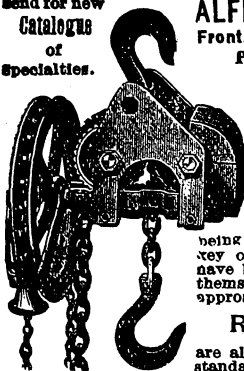
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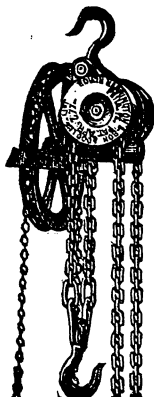
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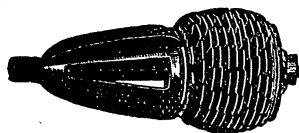
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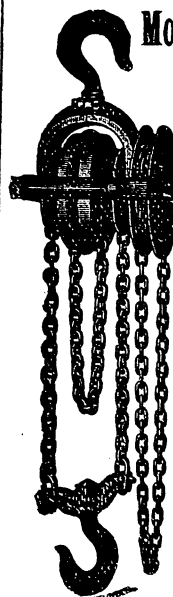
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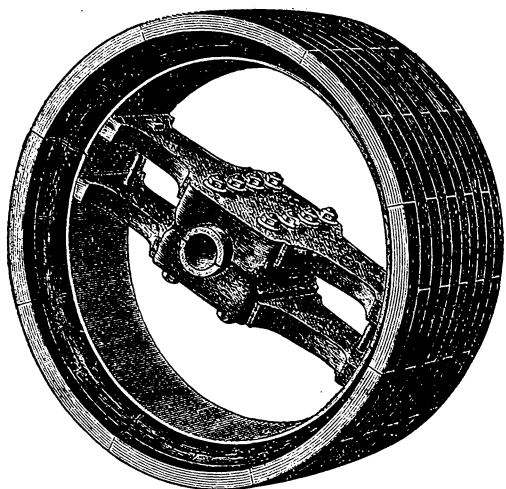
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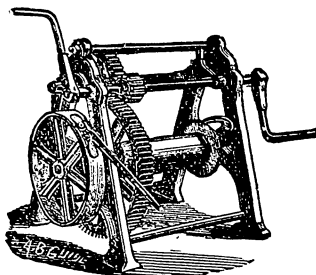


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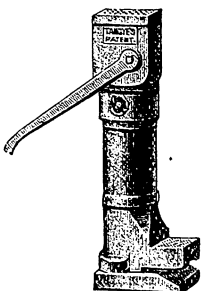
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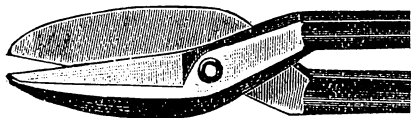
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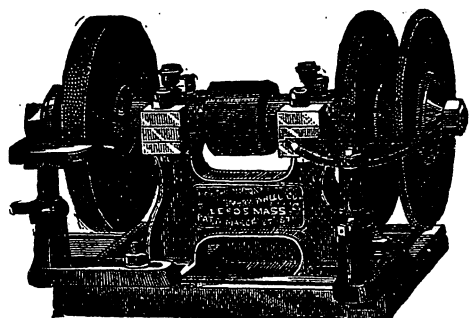
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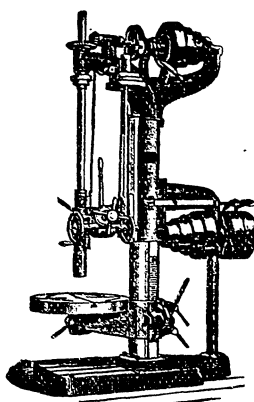
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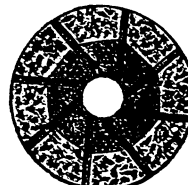
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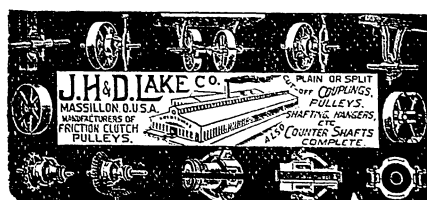
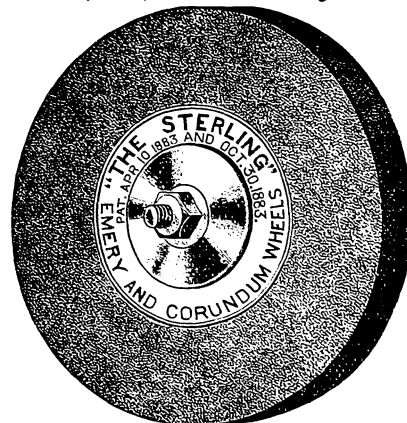
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Arranged by R. R. WILLIAMS, Hardware Editor of the Iron Age.

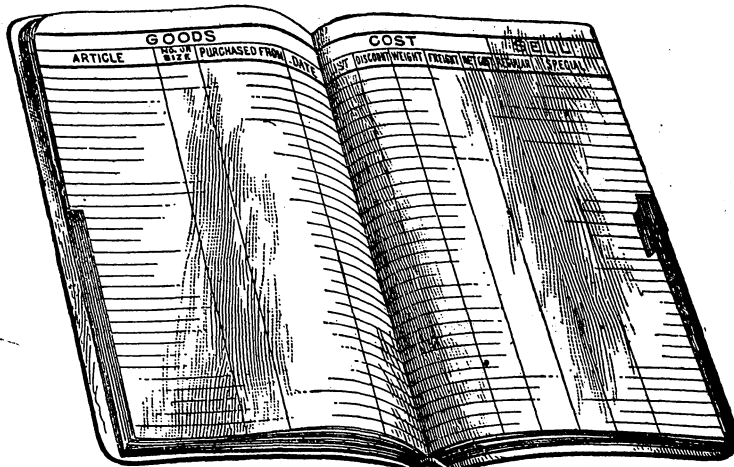
These Books are printed on paper of superior quality and bound in grain seal leather.

Columns are provided for the name and number or size, for noting from whom purchased, date of quotation or purchase, list and discount, and for entering freight expenses as an element of cost. Under the heading of selling prices, the regular and any special price, or remarks in regard to the goods are given place. This book goes into considerable detail in describing the goods and cost prices. It has been arranged in accordance with the views of many Hardwaremen whose methods are careful and exact.

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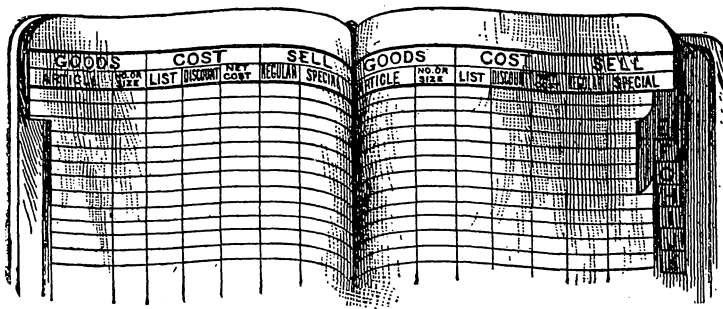
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In this book each page is complete, and the record of prices does not, as in Book A, run across two pages. Thus it accommodates a larger range of goods with much less detail in the record. It is adapted for office or store use, and by the use of familiar abbreviations, sufficiently large for the convenient and concise record of prices.

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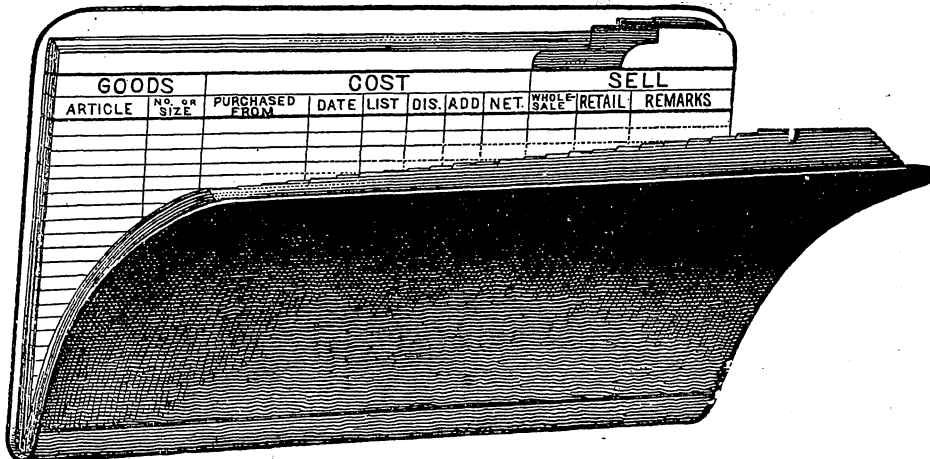
Hardware Price Book B.

The headings in Book C run across the top, in a line parallel with the hinge. In this way a very complete record can be kept on a single page. The details of weight and freight contained in Book A are omitted, and a single column headed "Add" given for the insertion of freight or other expenses which it is desirable to include in the cost. Under the selling prices space is left for the wholesale price, the retail price, and also for any remarks in regard to cost of the goods, desirability of pushing them, or other matters.

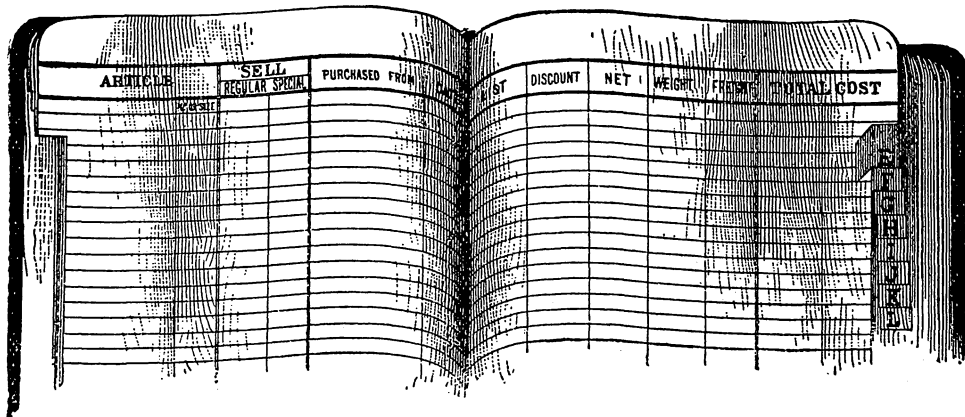
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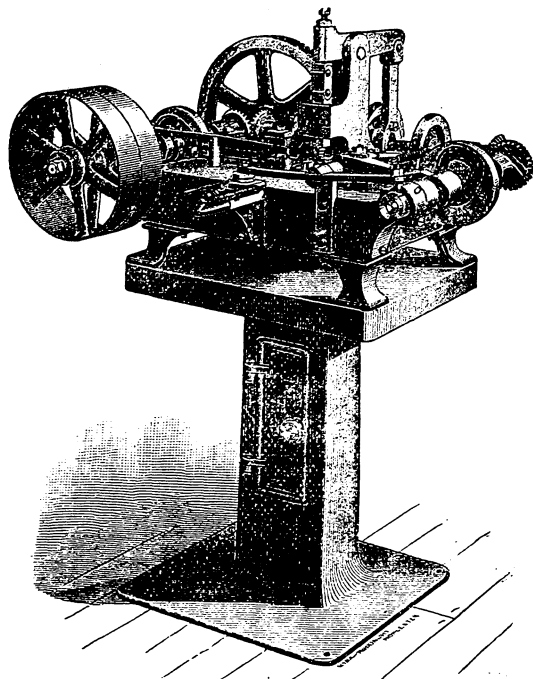
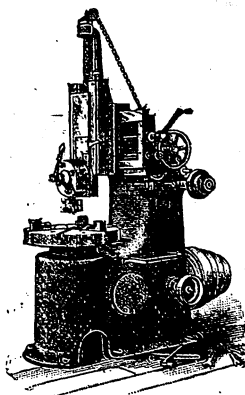
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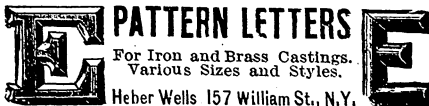
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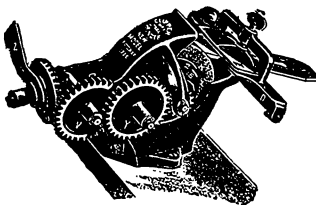
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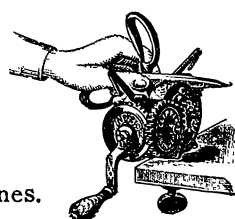
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FOR USE IN PRICE BOOKS.

Compiled by R. R. WILLIAMS, Hardware Editor of The Iron Age.

This pamphlet contains the principal standard Hardware price-lists in as clear and compact an arrangement as possible, so as to permit their being advantageously cut out and inserted in the price book. In order to make them adapted to this use they are printed on thin and tough paper of fine quality and on only one side of the paper.

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Pnts.	Plain	Turned.	Third or End.
1	\$0.30	.35	.39
1½	.32	.37	.44
2	.35	.39	.48
3	.42	.47	.56
Quarts.			
2	.50	.56	.63
2½	.53	.59	.68
3	.55	.62	.73
4	.60	.68	.84
5	.65	.75	.96
6	.70	.81	1.11
7	.75	.84	1.21
Gallons.			
2	.85	.96	1.31
2½	1.05	1.18	1.56
3	1.20	1.35	1.70

Wrenches.

Inches.	6	8	10	12	15	18	21
Black...	\$9.00	\$10.00	\$12.00	\$14.00	\$24.00	\$30.00	\$36.00
Bright..	10.00	11.00	14.00	16.00	26.00	32.00	38.00

Stove Hollow Ware.

Ground and Unground.

POTS, KETTLES, ETC. (CAST IRON.)						
No.	6	7	8	9	10	11
Pots.....	\$0.65	.75	.85	1.00	1.25	1.75
Kettles.....	.55	.65	.70	.85	1.00	1.40
T Kettles.....	.75	.80	.90	1.00	1.25	....
Spiders.....	.27	.30	.35	.40	.50	.60
Griddles Round	.22	.25	.27	.30	....	....
" Long..	.40	.50	.60	.75	....	....

SCOTCH AND YANKEE BOWLS.

No.	1	2	3	4	5	6
Scotch Bowls..	\$0.35	.40	.45	.50	.60	.70
Yankee Bowls.	.35	.45	.55	.65	.75	.90

As is obvious from the lists herewith reproduced, the shape and size of the different lists varies greatly, the aim being to give each list the smallest and most convenient arrangement possible. None of the lists are, however, more than 3½ x 6 inches in size, very few of them being as large as this and most of them very much smaller. In use it is intended that they shall be trimmed closely before they are inserted in price books, when they may be attached either by one edge close to the hinge of the book, as will, perhaps, be most convenient with the larger lists, permitting the use of the entire page for memoranda, or the smaller lists may be pasted on the page in connection with the entries in regard to discounts, freights, &c. Many of the lists are so compact in arrangement as when thus inserted to leave ample room for recording quotations.

Some merchants use this pamphlet for reference, checking off invoices, etc., as it gives the leading lists in a more convenient form than they can otherwise be obtained. The lists are, however, intended primarily to be cut out

Glue Pots.

Tinned or Enameled

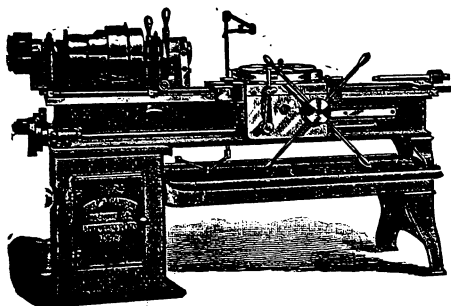
No.	4/0....	\$4.50	No. 2	....	\$8.40
3/0....	5.00		3	....	10.26
2/0....	5.50		4	....	12.42
0	6.00		5	....	14.58
1	6.75		6	....	16.94

and inserted in price books, and can be used in connection with any of The Iron Age Hardware Price Books.

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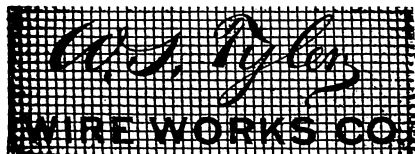
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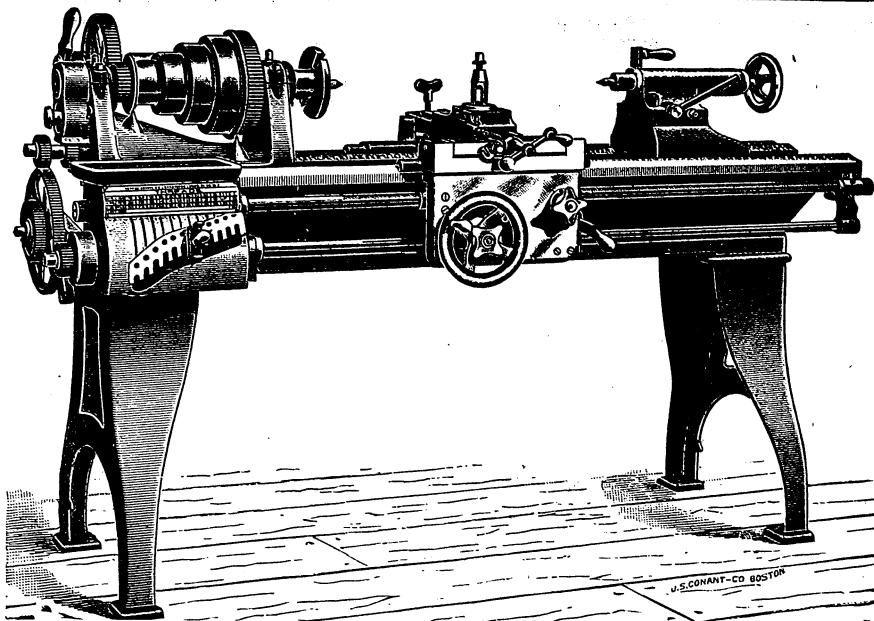
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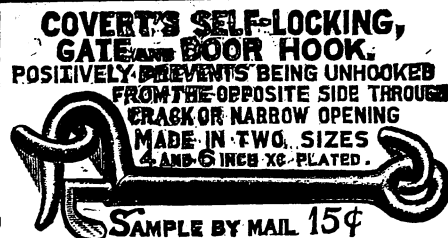
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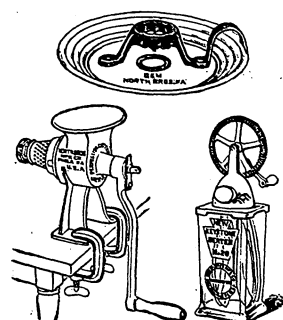
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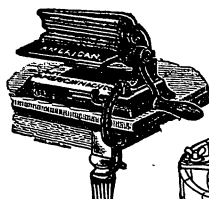
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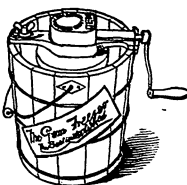


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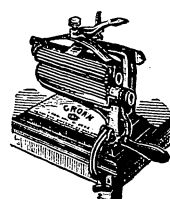
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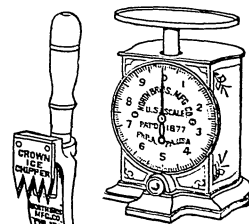


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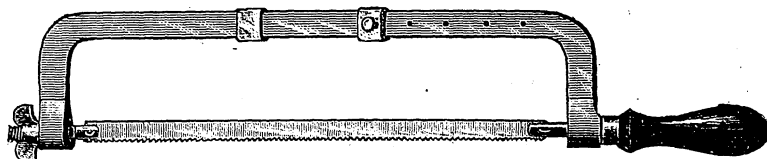
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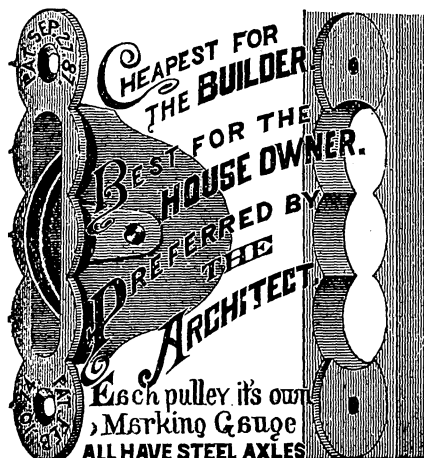
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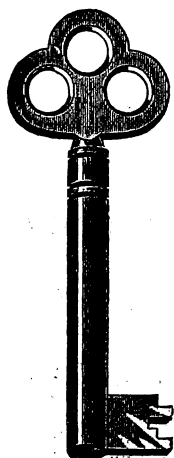
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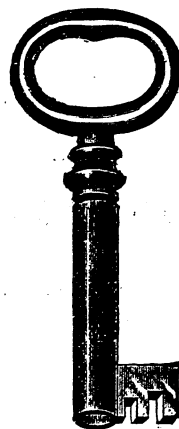
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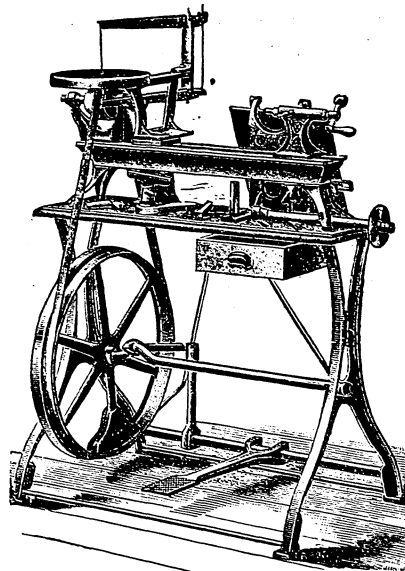
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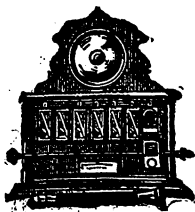
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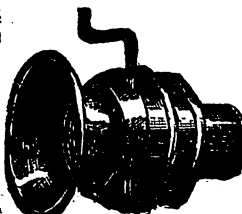
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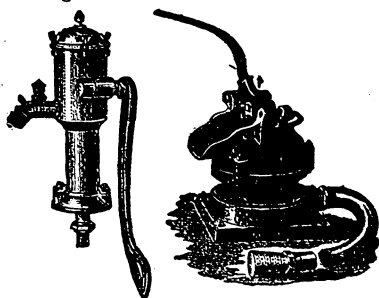
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Fig. 209.

Fig. 381.

Fig. 145.



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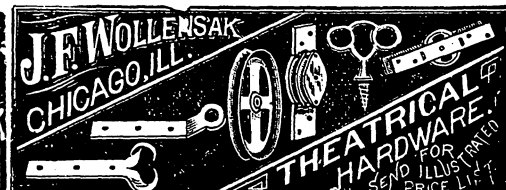
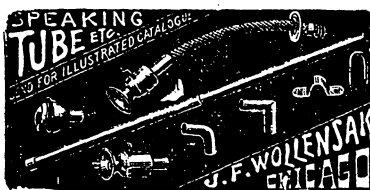
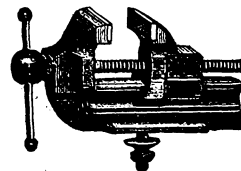
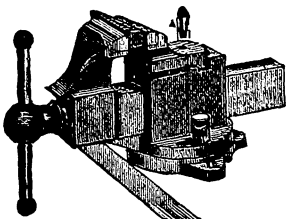
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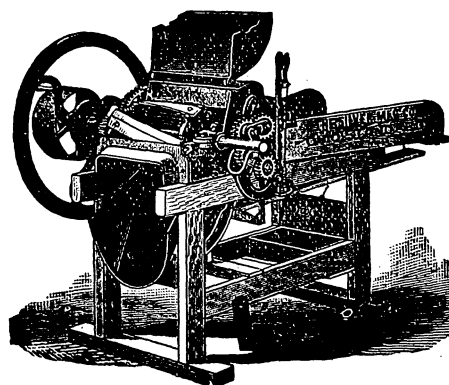
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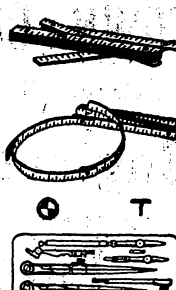
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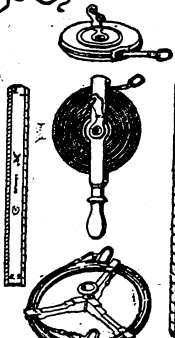
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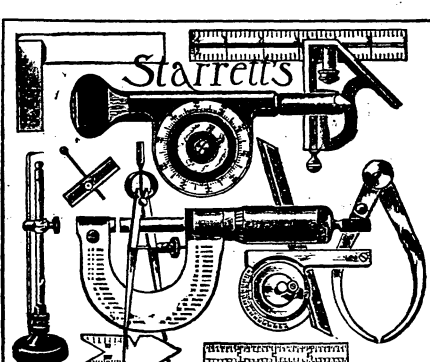
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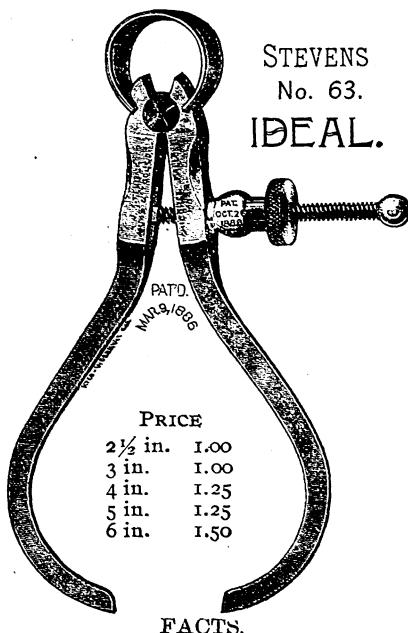
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Prevent all vibration and render Saw Filing noiseless.
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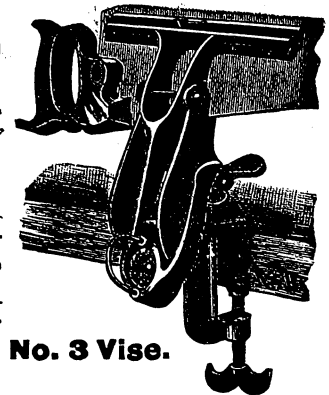
No. 1 (11 inch Jaws),	-	PER DOZ. \$15.00
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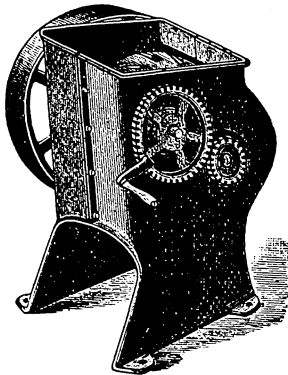
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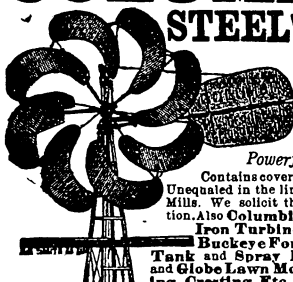
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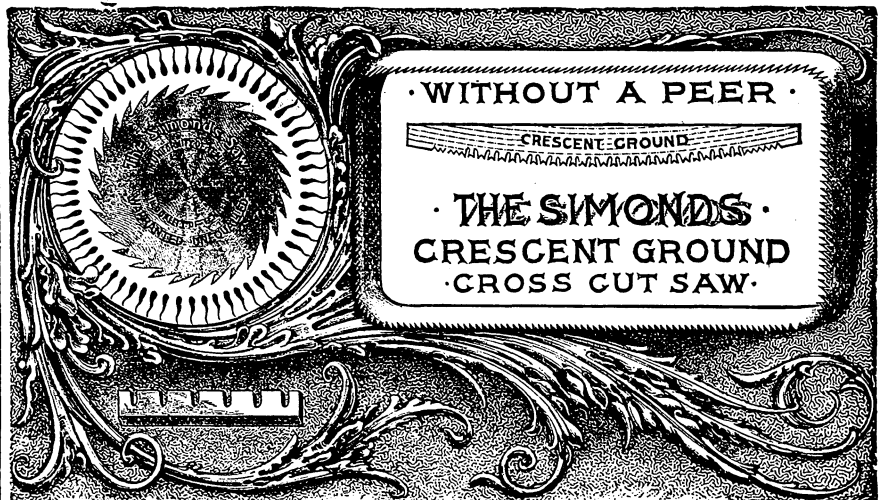
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Best Common Mouse Traps, Steak Hammers,
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Mechanics are now inquiring for this tool, and Hardware Dealers
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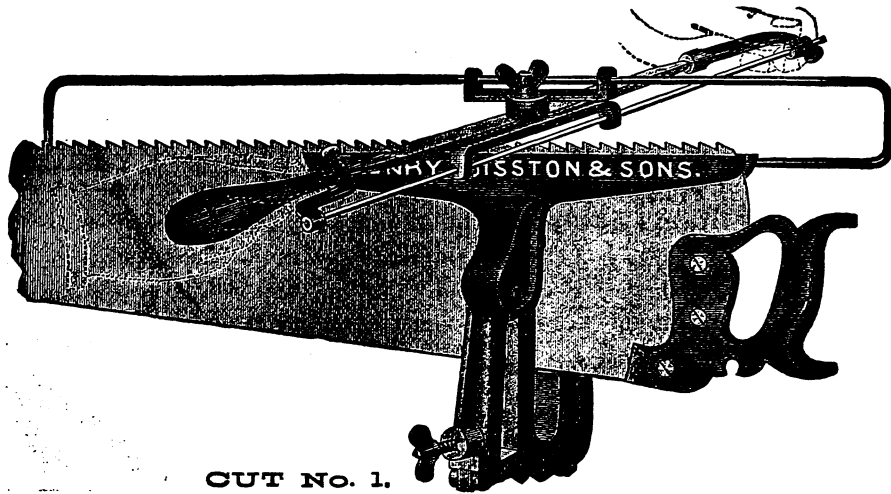
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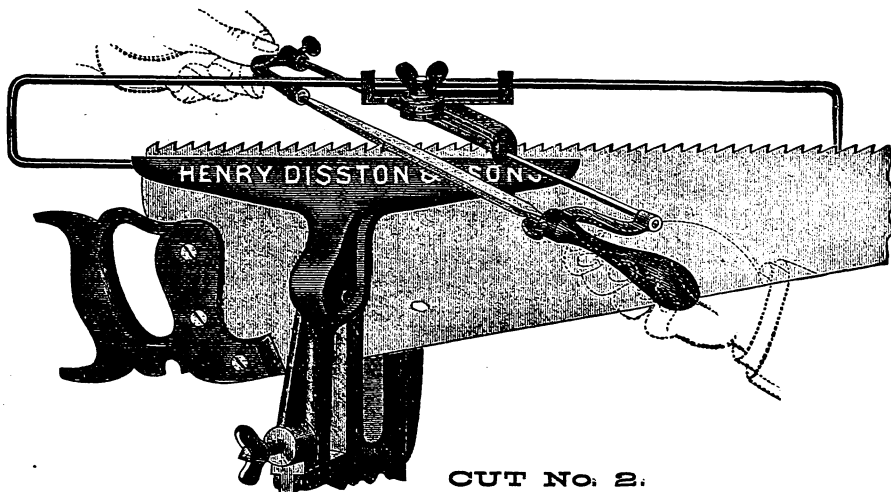
DISSTON'S Improved Saw Clamp AND FILING GUIDE.

ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART
OF SAW FILING TO FILE A SAW CORRECTLY.



CUT No. 1.

Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT No. 2.

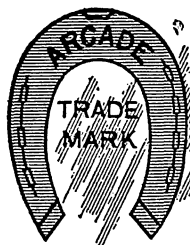
To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

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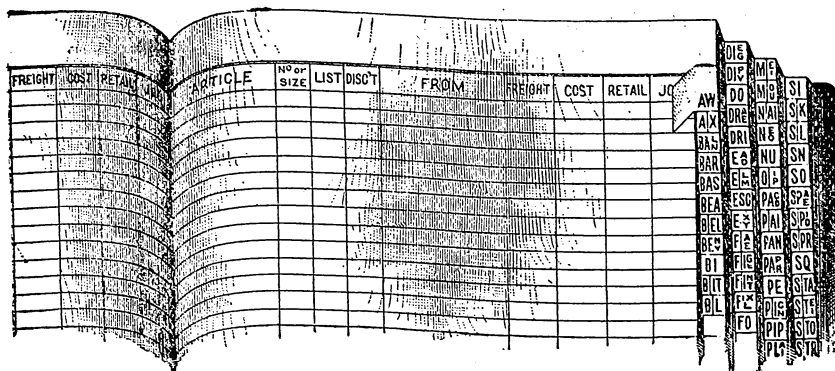
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The fact that the Arcade File Works alone use the improved File Machinery recently invented by Alfred Weed, and the even heat of natural gas, enables them to produce files that cut faster and wear longer than any on the market.

The Iron Age Hardware Price Book F.

WITH MULTIPLE INDEX (Patent Pending).



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AN	DI ₇	MO	SK
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AX	DRI	NU	SO
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Sufficient space has been provided for large lines of goods such as Axes, Bits, Springs, etc., by allowing four pages to such indices, instead of two pages, as for lines of goods requiring less space. This is accomplished, as in AX for example, in Book F by having a short tab with the letter A on the tab on the first leaf, and AX on the tab on the second leaf. The A on the first leaf is directly over the A on the lower leaf, so that the index reads AX whether looking at both leaves together, or at the lower one only.

The four rows of index tabs are printed in gold letters on black Russia leather. The tabs are securely fastened on both sides of each page, making a handsome and durable index.

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Advantages of Multiple Index Price Book.

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For Augers,	turn to	AU	For Chisels,	turn to	CH ₁	For Iron,	turn to	IRO
" Parers, Apple	"	PA _P	" Cutlery,	"	CUT	" Irons,	"	IR'S
" Saws,	"	SAW	" Cartridges,	"	CAR	" Shovels,	"	SH ₀
" Pumps,	"	PUM _N	" Rules,	"	RU _P	" Grindstones,	"	GRI
" Bits,	"	BIT	" Locks,	"	LO	" Stones,	"	STO

Special care has been taken to make the classification as indicated in the index correct and comprehensive, making provision for all Hardware articles and giving sufficient space for the keeping and recording of prices. It is thought that every strictly Hardware article has its first two or three letters given, thus permitting immediate reference to it by a single motion.

It is, however, obvious if any articles are not directly designated by the index characters, that the index, being alphabetical in its arrangement, indicates the place where quotations on such articles should be recorded. The supplement, however, may be found useful for quotations on any outside goods which the Hardwareman may desire to keep prices on, while at the same time it may be used if necessary for an overflow of matter from the preceding pages, or to contain list prices or other matter relating to goods.

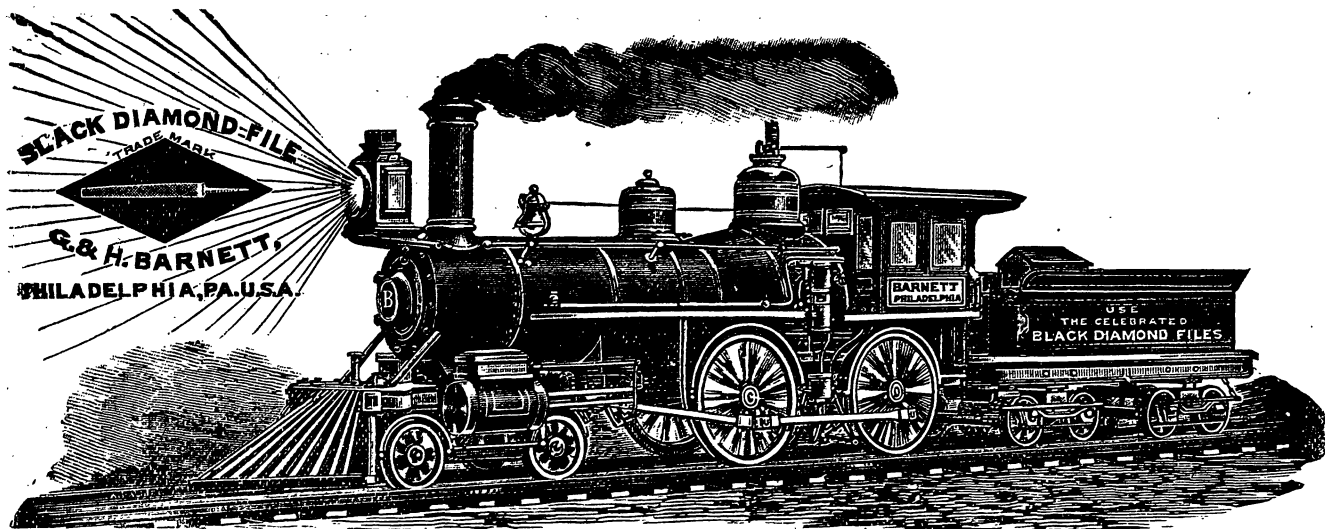
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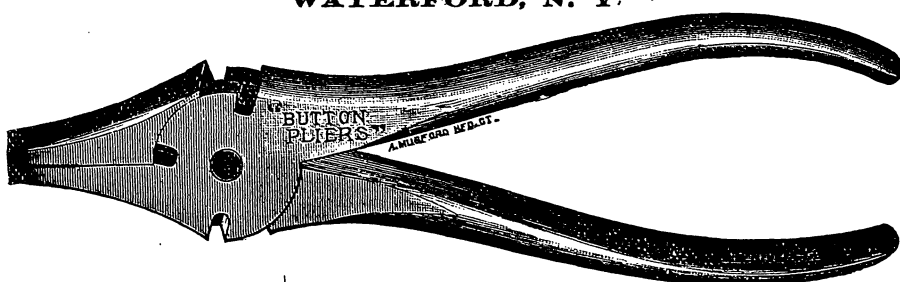
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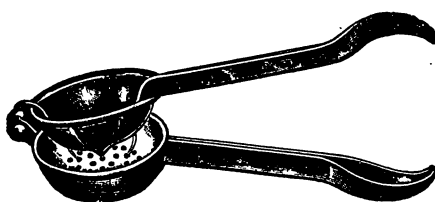
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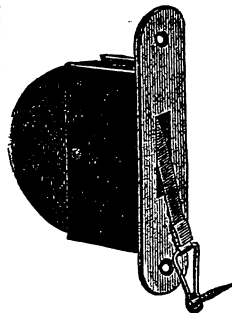
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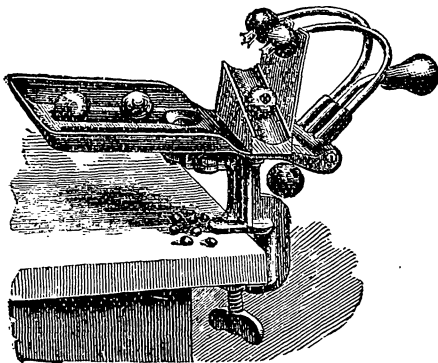


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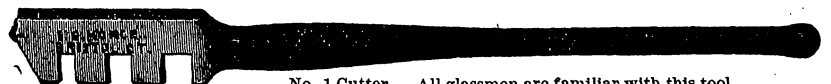
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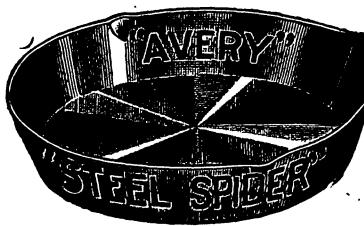


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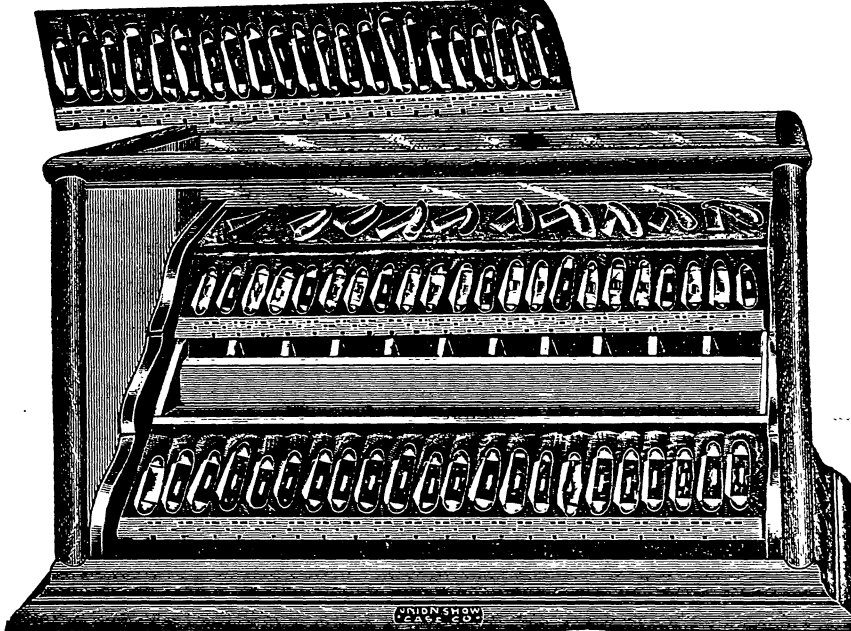


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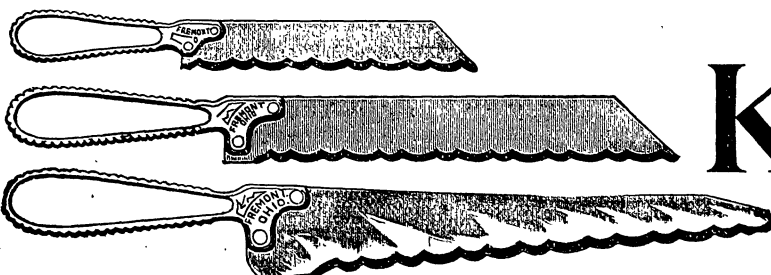
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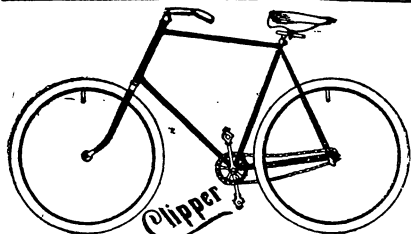
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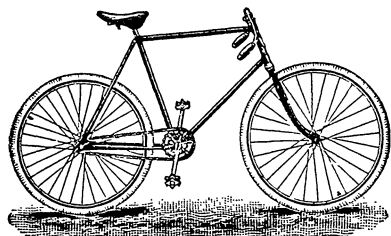
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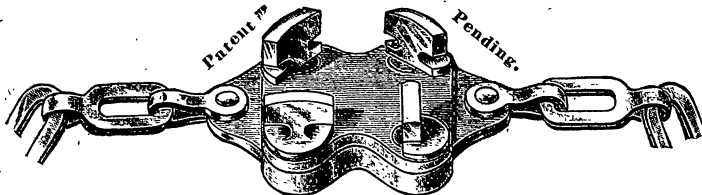
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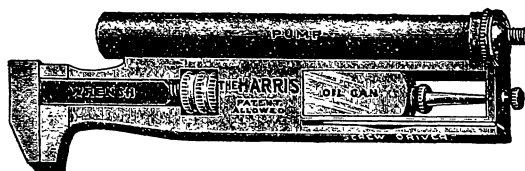


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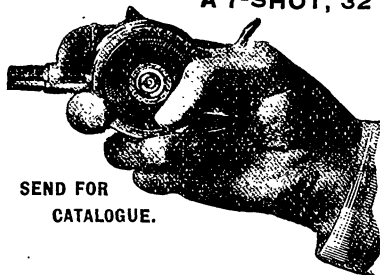
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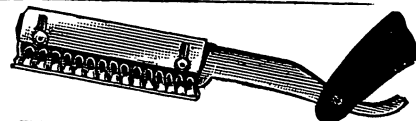
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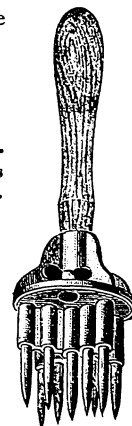
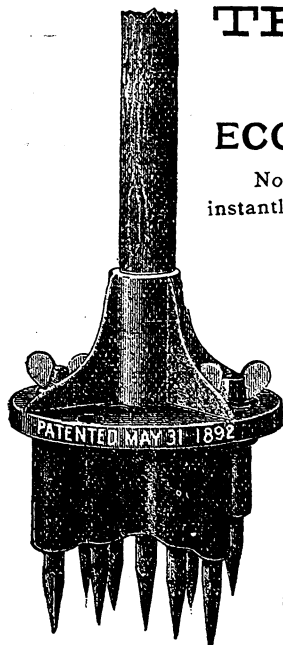
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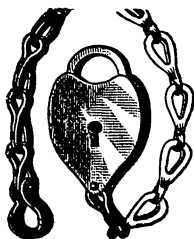


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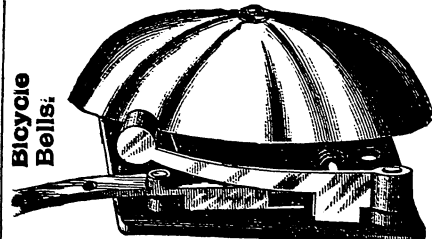
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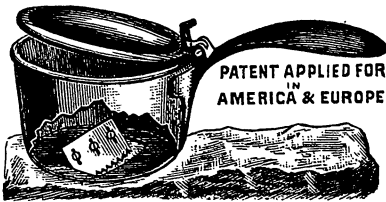
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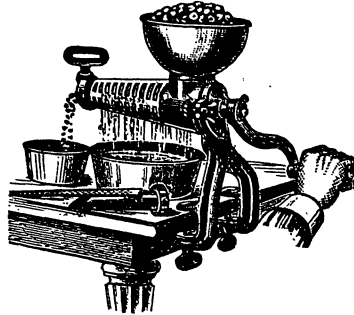
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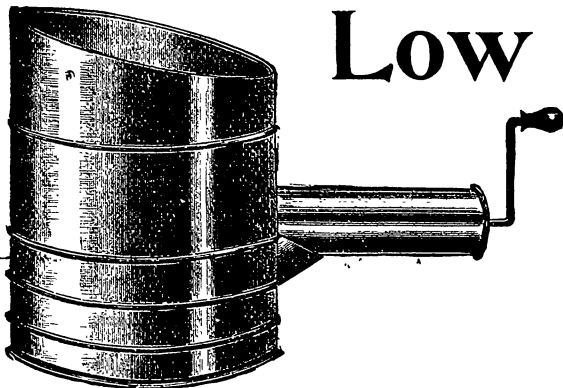
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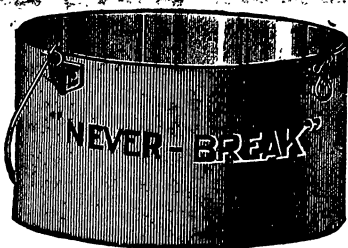
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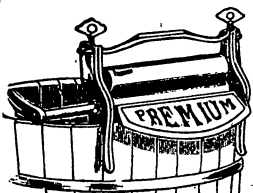
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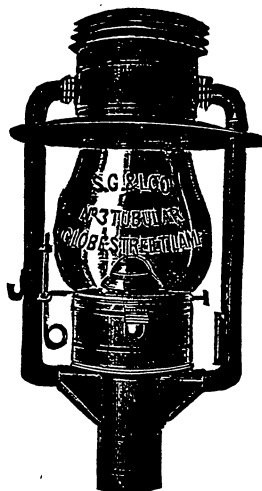
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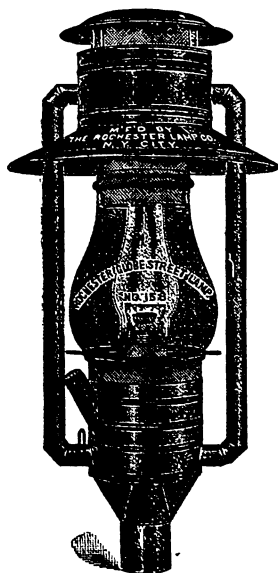
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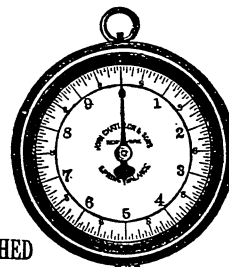


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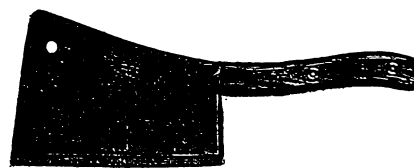
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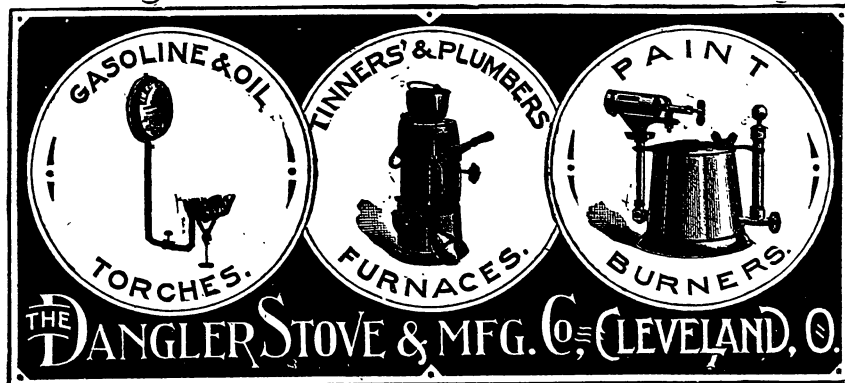


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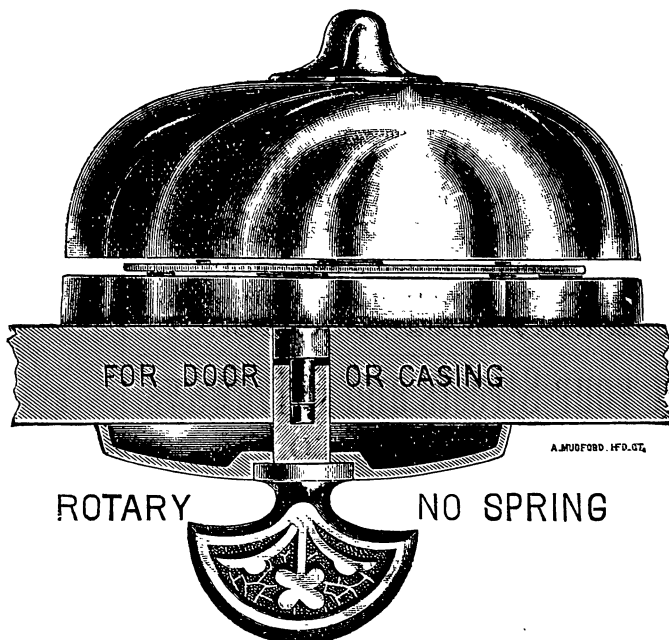
ELECTRICAL RESULTS.

3 Inch.

No. 91, Nickel Plated.

No. 92, Bronze Plated.

Per Doz., \$17.50.



3 1/2 Inch.

No. 101, Nickel Plated.

No. 102, Bronze Plated.

Per Doz., \$20.00.

Simply turning the knob about one-fourth in either direction produces about ten clear, full tones, which though not startling or annoying, can be better heard all through the house than any bell ever made to imitate Electrical Results.

SOLE AGENTS,

JOHN H. GRAHAM & CO.,

113 Chambers St.,

N. Y. CITY, N. Y.

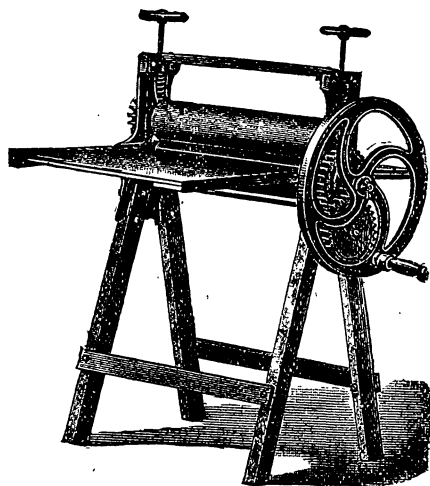
WRITE FOR PRICES.

The Family Mangle.

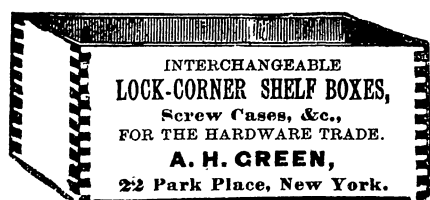
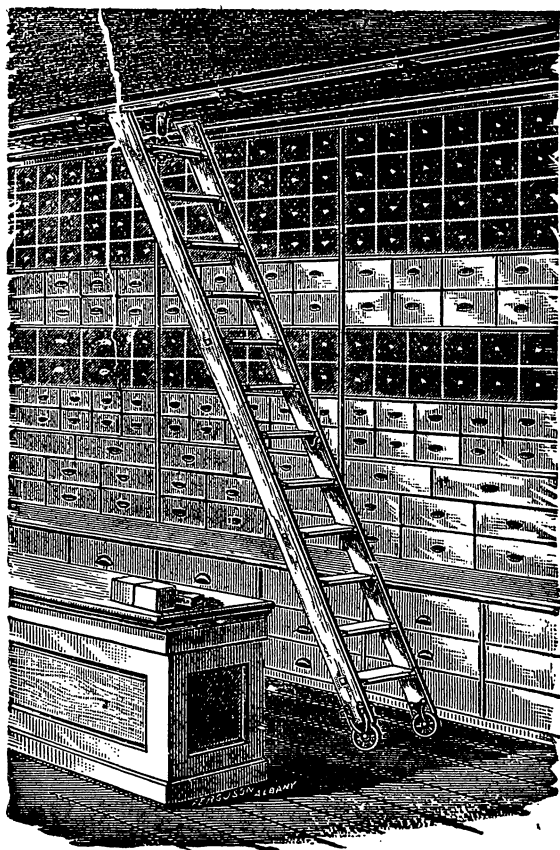
WARRANTED TO DO
Better Work than Hand-Work.

SAVES all the fuel,
two-thirds the work.
Keeps the linen whiter.

We Guarantee Every Machine.



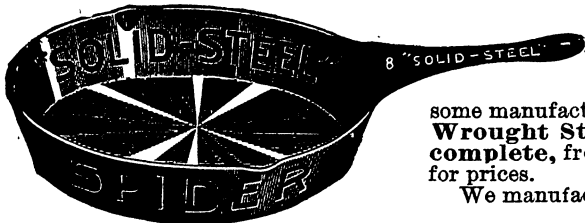
Send for descriptive circular to
S. C. Johnson, Racine, Wis.
Agents Wanted.

**THE "NOISELESS" STORE LADDER.**

The latest and best. Perfectly noiseless. Neat in appearance

Manufactured by

M. CROISSANT,**ALBANY, N. Y.**

"SOLID-STEEL" SEAMLESS HOLLOW WARE.

No Seams, no Rivets in "Solid-Steel" Ware.

Brilliant Finish.

Notwithstanding the claims made by some manufacturers' agents our spiders are made from **Wrought Steel, Without Seams or Rivets, complete, from a single piece of metal.** Write for prices.

We manufacture our own goods.



"Solid-Steel" Maslin Kettle.

The Cleveland Stamping & Tool Co., Cleveland, O.

We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.

An Investment

- ✱ That soon pays for itself, and a fixture you will wonder
- ✱ how you have got along without. Hundreds of recom-

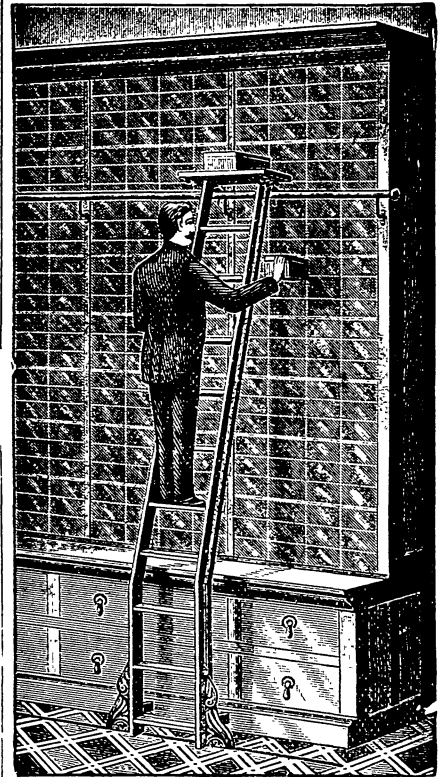
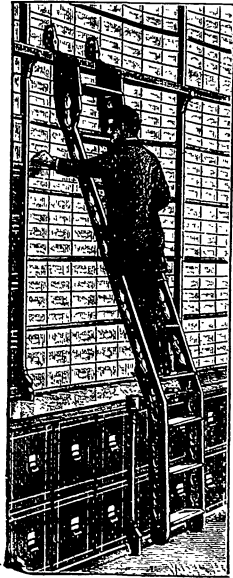
mendations to this effect. This is without doubt the best device of the kind on the market to-day. Steel rail planed to get the smoothest surface. Brackets made to fasten to standards, pilasters, or shelving direct. Can be adjusted to shelving with wide or narrow ledge, and can also be fitted where there is no ledge and can be used on circular rail as well.

WORLD'S FAIR AWARD.

A postal card will get our Catalogue.

Morley Brothers,

123 N. Washington Ave., Saginaw, Mich.

**FLOOR TRACK BICYCLE LADDER**

Highest Award Columbian Exposition.
No other Ladder Service can approach the "Bicycle" in ease and convenience of operation. Compared with others they work like a bicycle beside a lumber wagon.

Can be applied to any kind of shelving made. See this space next week for other styles.

Send for Illustrated Catalogue and prices to
THE BICYCLE STEP LADDER CO.,

50 State street, Chicago, Ill.

WATER COOLERS.

**Handsome
New Designs.
Double Walled.
Packed.**

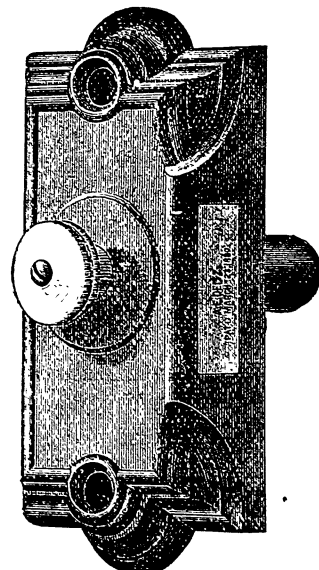


No. 82,	2 gals.	.....\$3.40
" 83,	3 "	..... 4.00
" 84,	4 "	..... 4.50
" 86,	6 "	..... 5.60
" 93,	3 "	..... 4.60
" 94,	4 "	..... 5.25
" 96,	6 "	..... 6.50
" 98,	8 "	..... 7.75
" 110,	10 "	..... 12.50
" 114,	14 "	..... 16.75

Discounts Furnished upon Request.

**Sidney Shepard & Co.,
BUFFALO, N. Y.**

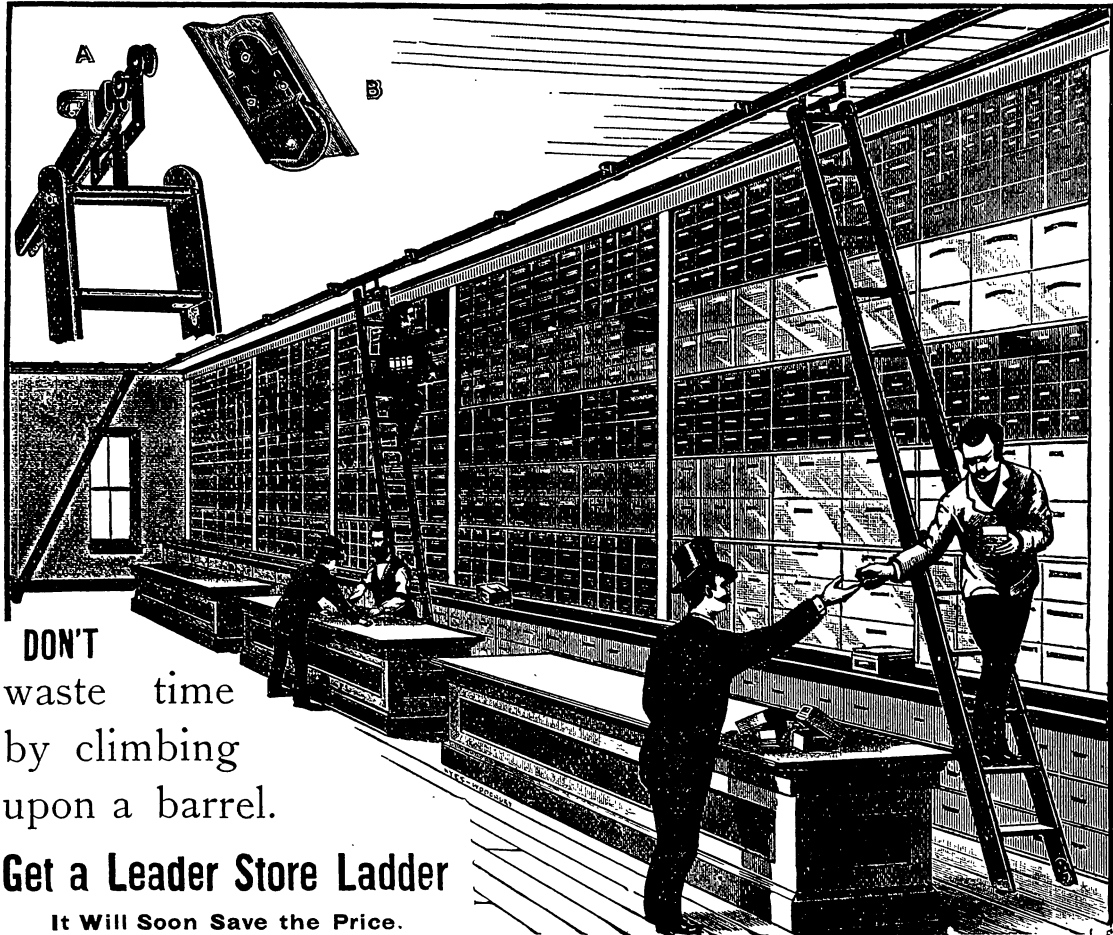
**C. Sidney Shepard & Co.,
CHICAGO, ILL.**

A. E. DEITZ.

**J. C. McCARTY & CO., Agents, 97 Chambers
and 81 Reade Sts., New York.
Factory, BROOKLYN, E. D., N. Y.**

THE TROLLEY LEADER STORE LADDER.

See Our Advertisement Next Week.



Parlor, Barn and Fire Door Hangers.

DON'T
waste time
by climbing
upon a barrel.

Get a Leader Store Ladder

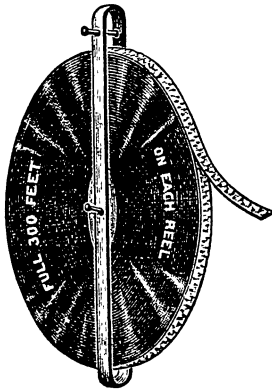
It Will Soon Save the Price.

THE COBURN TROLLEY TRACK MFG. CO., - HOLYOKE, MASS.



To Users of Box Straps:

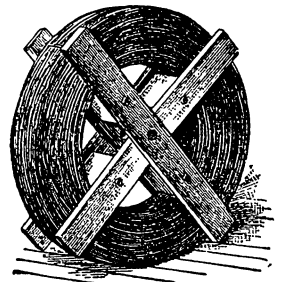
A thin Metal Strap, through which a nail can be driven without punching.



Put up in 300-foot Reels and Bundles of 100 pairs each, from 4 to 12.

Certain competitors of ours have issued circulars pretending to **have secured injunctions against us on our Self-Drawing Wire Strap** (as shown in cut above), and on **Steel Straps on Reels** (see cut of Reel herewith). **Such statements are absolutely false.**

We have not been enjoined, either on our well-known Reels, or on the **Self-Drawing Wire Strap**, on which we own **the only patent in existence**. On the Reel, these parties asked injunction and **were refused by the Court**. On the Strap, **we sued them** for infringing our patent; they at once changed their goods by stamping out the stock, making them weak and valueless. We therefore dropped the suit, and formal order of dismissal was entered. This is all the basis there is for the talk of "final judgment on April 2d." Our customers may depend on absolute protection on our goods as above. Very respectfully,



DE HAVEN MANUFACTURING CO.,

50, 52 and 54 Columbia Heights, - - - BROOKLYN, N. Y.

Brooklyn, May 18th, 1894.

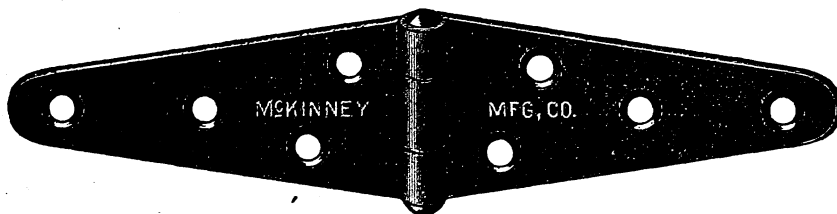


STEEL HINGES AND BUTTS.

— STANDARD GOODS. —

McKINNEY MFG. CO.. - ALLEGHENY, PENN.

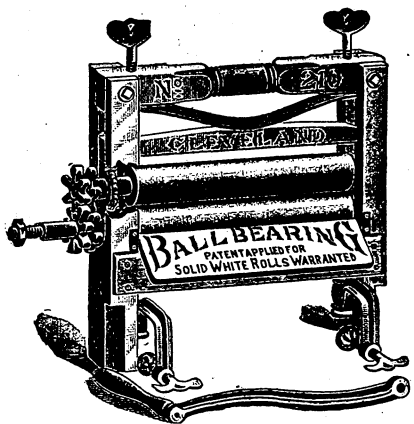
SEND FOR
LIST.



ORDERS FILLED
ON SIGHT.

"NONE BETTER."

A GOOD PROFIT TO DEALERS



This Wringer has **BALL BEARINGS** same as a bicycle. Runs so easy it's play to use it. No other like it. Best made. Sells for more than the common kind. Women using it won't have any other, tell their neighbors, sales increase, everybody satisfied. Pays you to push it.

SEND FOR SAMPLE.

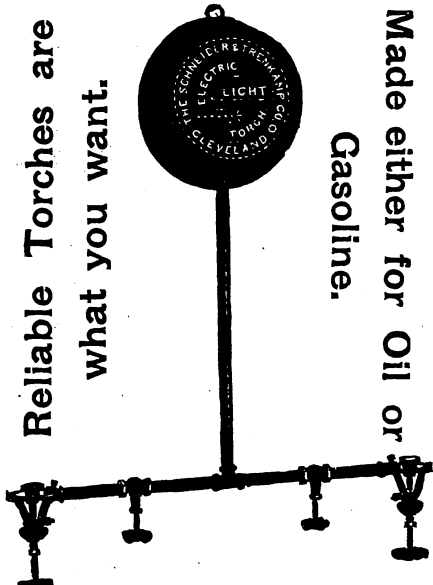
ALL OTHER KINDS OF WRINGERS.

THE PEERLESS MANUFACTURING CO.,
CLEVELAND, OHIO.

We also make High Grade Bicycles.

OSGOOD & HOWELL, Pacific Coast Agents,

132 Market St., San Francisco, Cal.



Reliable Torches are
what you want.

Made either for Oil or
Gasoline.

These Torches are particularly adapted for use in Factories, Foundries, Machine Shops, Rolling Mills, Blacksmith Shops, Warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner.
Write us for prices. A liberal discount given to the trade.
Manufactured by
THE SCHNEIDER & TRENKAMP CO.,
Nos. 479 to 497 Case Ave., Cleveland, Ohio.

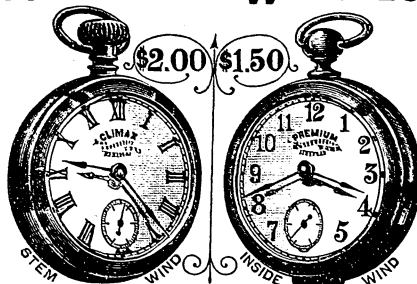
IT PAYS HIM.

It always pays the Hardware Dealer to have neat and attractive Wooden Shelf Boxes. With samples on the front they save the salesman's time and attract the customer's money. Everybody knows this, but everybody has not yet sent for our Catalogue and proof. We have Wire Stitched Folding Paper Boxes for manufacturers; other Paper Boxes for every use, and Wooden Shelf Boxes as above. Write to

JESSE JONES & CO.,
615 and 617 Commerce St., Philadelphia.



AMERICAN WATCHES.



During 1894 the sales on these watches amounted to 600,000, the larger portion through hardware dealers. We furnish them in Nickel and Gilt, Fancy and Plain Cases, Roman or Arabic Dials. Sample Stem Wind \$2.00, post-paid, \$15.60 doz., including a chain with each watch. Sample Inside Wind \$1.50, post-paid, \$12.60 doz., also including a chain with each.

R. H. INGERSOLL & BRO., Sole Mfrs.,

65 Cortlandt St., New York.

THE SCHULTZE LOCK UNPICKABLE.

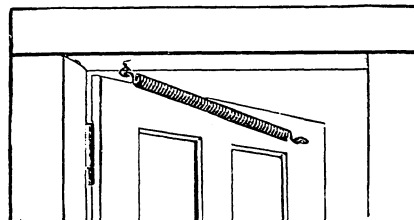


SEND FOR CIRCULAR.

MANUFACTURED ONLY BY

The Schultze Mfg. Co.
Cor. Emerald & Wishart Sts., Phila., Pa.

THE PERFECT DOOR SPRING.

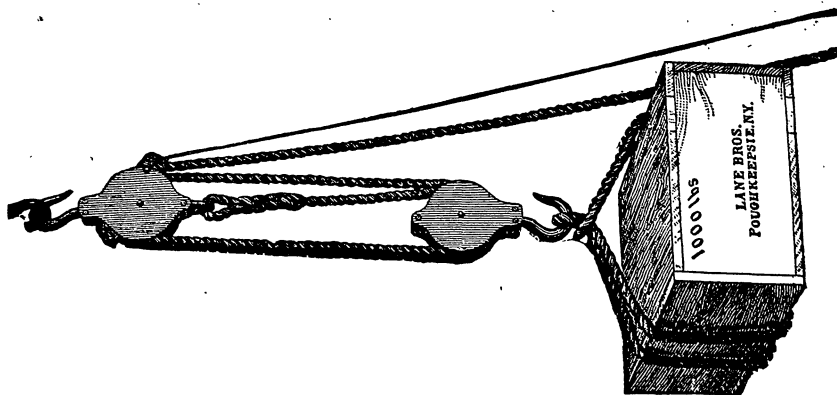


Cheap, Simple, Durable, Effective.

Best Screen Door Spring made. Send for our list of references, comprising some of the first houses in the land. They sell readily, and that is what you are looking for. Drop us a postal.

COILED WIRE BELTING CO.,

40 & 42 Noble St., Jersey City.



LANE'S SELF-LOCKING TACKLEBLOCKS

Anti-Friction Steel Bushings,

Holds the load at any point, and always sure.

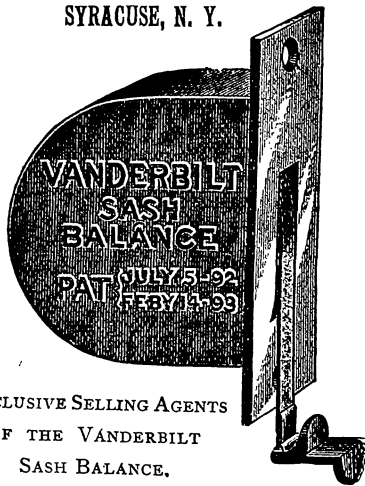
SEND FOR CIRCULAR.

For sale by the Hardware trade.

—MANUFACTURED BY—

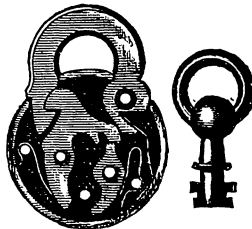
LANE BROS.
POUGHKEEPSIE, N. Y.

E. C. STEARNS & CO.
SYRACUSE, N. Y.



EXCLUSIVE SELLING AGENTS
OF THE VANDERBILT
SASH BALANCE.

PATENT PERFECTION PADLOCK.



Eight Tumblers, Key Turning Both Ways.

Sizes, $\frac{1}{4}$ inch to $2\frac{1}{4}$ inches, of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also, $\frac{1}{2}$ and $\frac{3}{4}$ inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world.

Adopted by the United States Treasury for bonded warehouses.

AMES SWORD CO., Chicopee, Mass.

Send for Price-Lists and Circulars.

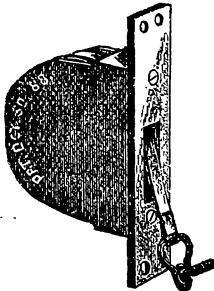
DOES IT PAY?

To buy an inferior article, which your trade condemns, when you can get

THE CALDWELL SASH BALANCE.

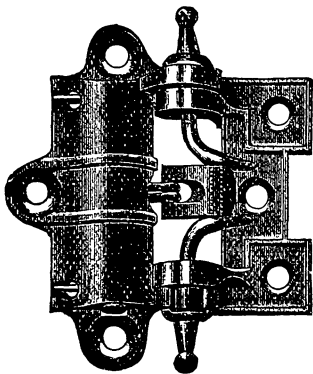
The best material, right principle and care in making and testing have made it the LEADER for five years. Write to

CALDWELL MFG. CO., Rochester, N. Y.



NEW IDEA SPRING HINGE

Holds the door strongest when closed.



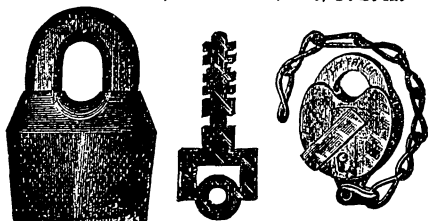
Resistance gradually decreases in opening.

and increases in closing the door.

A covered (patented) hold-back Spring Hinge. Full particulars, free Sample and Prices by mentioning this paper.

STOVER MANUFACTURING CO.,
145 River St., Freeport, Ill.

ESTABLISHED 1879.
KEYSTONE LOCK WORKS.
E. T. FRAIM, Lancaster, Pa., U. S. A.



Originators, designers, patentees and manufacturers of all the leading popular styles of **PADLOCKS**, Key-Locking Scandinavian with our patent Inter-Locking Tumblers; the only reliable lock of this style ever made. **SELF-LOCKING** Scandinavian of the highest type of perfection. Dust Proof Railroad, Freight Car and Switch Padlocks. Brass, Bronze, Steel and Malleable Iron Padlocks for all purposes and in all finishes. 131 different kinds. Write for our new 100-page catalogue.

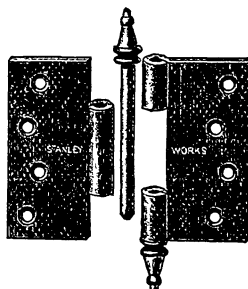
SURPLESS DUNN & ALDER, General Agents,
97 Chambers St., NEW YORK

Wrought Steel Butts

—MADE FROM—

Cold Rolled Steel.

ANY FINISH DESIRED.



The Stanley Works, New Britain, Conn.
79 Chambers St., N.Y.

"DUPLEX" BUTTS.

COLD ROLLED.

Wrought Steel and Wrought Bronze.

HARDENED STEEL BUSHINGS.

READING HARDWARE COMPANY,
READING, PA.

NEW YORK,
96 & 98 Reade Street.

PHILADELPHIA,
514 Commerce Street.

CHICAGO,
73 Wabash Avenue.

BOOKS

YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing **DAVID WILLIAMS, Publisher** and Bookseller, 96-102 Reade Street, New York.

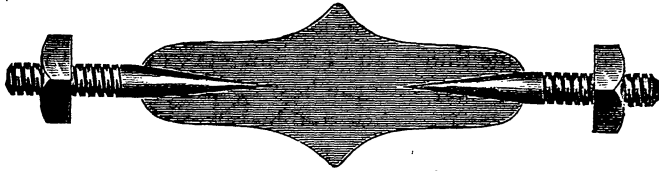
RICHARD ECCLES,**AUBURN, N. Y.,**

—MANUFACTURER OF—

CARRIAGE FORGINGS,

Couplings, Clips, King Bolts, Fifth Wheels, &c.

SEND FOR SUPPLEMENT TO CATALOGUE,



Showing a full line of Axle Clips, Spring Bar Clips
and Three Piece Saddle Clips.

SEND FOR CATALOGUE AND SUPPLEMENT.

SASH WEIGHTS!**NORTON BROTHERS,**

Manufacturers,

Office: 813 Masonic Temple, CHICAGO.

WORKS AT MAYWOOD, ILL.

WHY USE WOODEN OR HEAVY STEEL BLOCKS

WHEN THE STEEL AND IRON

TACKLE BLOCKS

—MADE BY—

The Cleveland Block Co.,

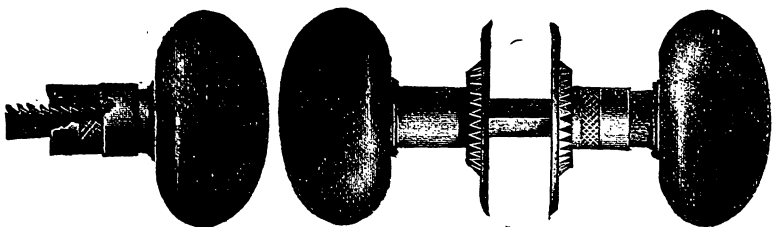
CLEVELAND, OHIO, U. S. A.,

ARE BETTER IN EVERY WAY.

No waste material. Every ounce of weight in the line of
strength. No clumsy outside straps or bolts. As light as
wooden blocks and vastly more durable. They wear, but never
break. Sheaves interchangeable.

General Agents: Topping Brothers, 92 Chambers Street, New York.
New England Agents, - Dodge, Haley & Co., 212 High Street, Boston.

Sectional cut showing con-
struction of Knob.



Half size cut of knob as ap-
plied to door. No SIDE
SCREWS OR ADJUSTING
WASHERS.

Don't you want your stock to represent the latest and most improved up to date Hardware? The
Whipple Patent Door Knob is the latest and best Door Knob attachment ever made. Give it a trial.
PERRY & WHIPPLE CO., New Haven, Conn.

New York Sales Agent, E. G. SHEPARD, 142 Chambers Street.

THE STAR
COIL SPRING SHAFT SUPPORT
AND ANTI-RATTLER.

Fast selling, always gives satisfaction. No
weight on horse. Worth twice the cost for conven-
ience in hitching up. Agents wanted. Send stamp
for circular. Price, \$1.50. State rights for sale.

THE DECATUR SHAFT SUPPORT CO.
Decatur, Ill.

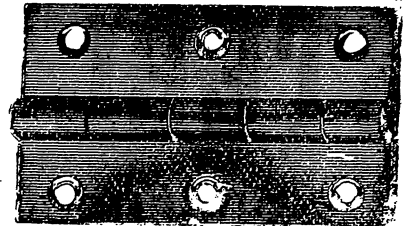
GET THE BEST!
SELLS AT SIGHT!

Carriage Forgings

Of every description. Also Special
Forgings.

E. D. CLAPP MFG. CO., Auburn, N. Y.

New illustrated catalogue issued May 10th
mailed on application.

**Cast Brass Butt Hinges**

IN STOCK AND FOR SALE BY

W. & J. TIEBOUT,

Nos. 16 & 18 Chambers Street, New York,

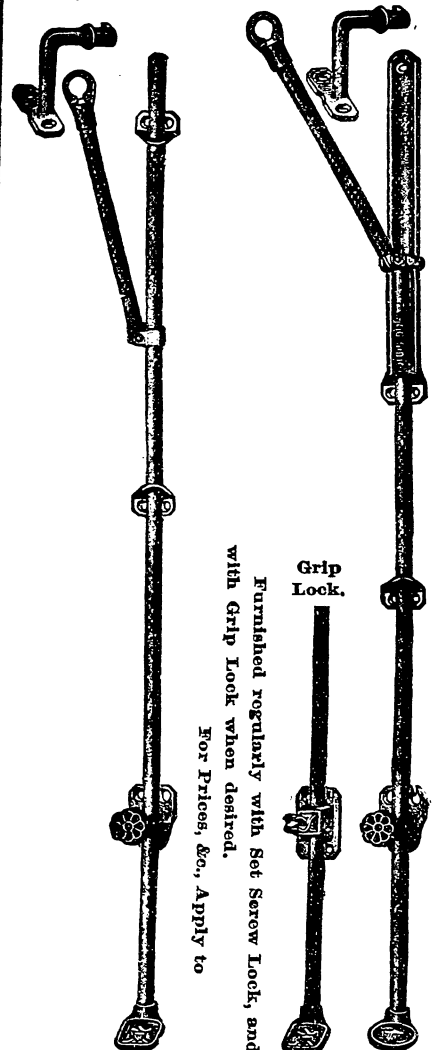
MANUFACTURERS OF

BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE.

TRANSOM LIFTERS

"EAGLE."

"SHIELD."



Furnished regularly with Set Screw Lock, and
with Grip Lock when desired.
For Prices, &c., Apply to

J. F. WOLLENSAK, PATENTEE

CHICAGO, ILLINOIS.

THE WILCOX & HOWE COMPANY,

BIRMINGHAM, CONN.

MANUFACTURERS OF

A Full Line of Carriage Hardware**ALSO SPECIAL FORGINGS.**

Estimates cheerfully given. Send for Catalogue.

SASH WEIGHTS**E. E. BROWN & CO.,**

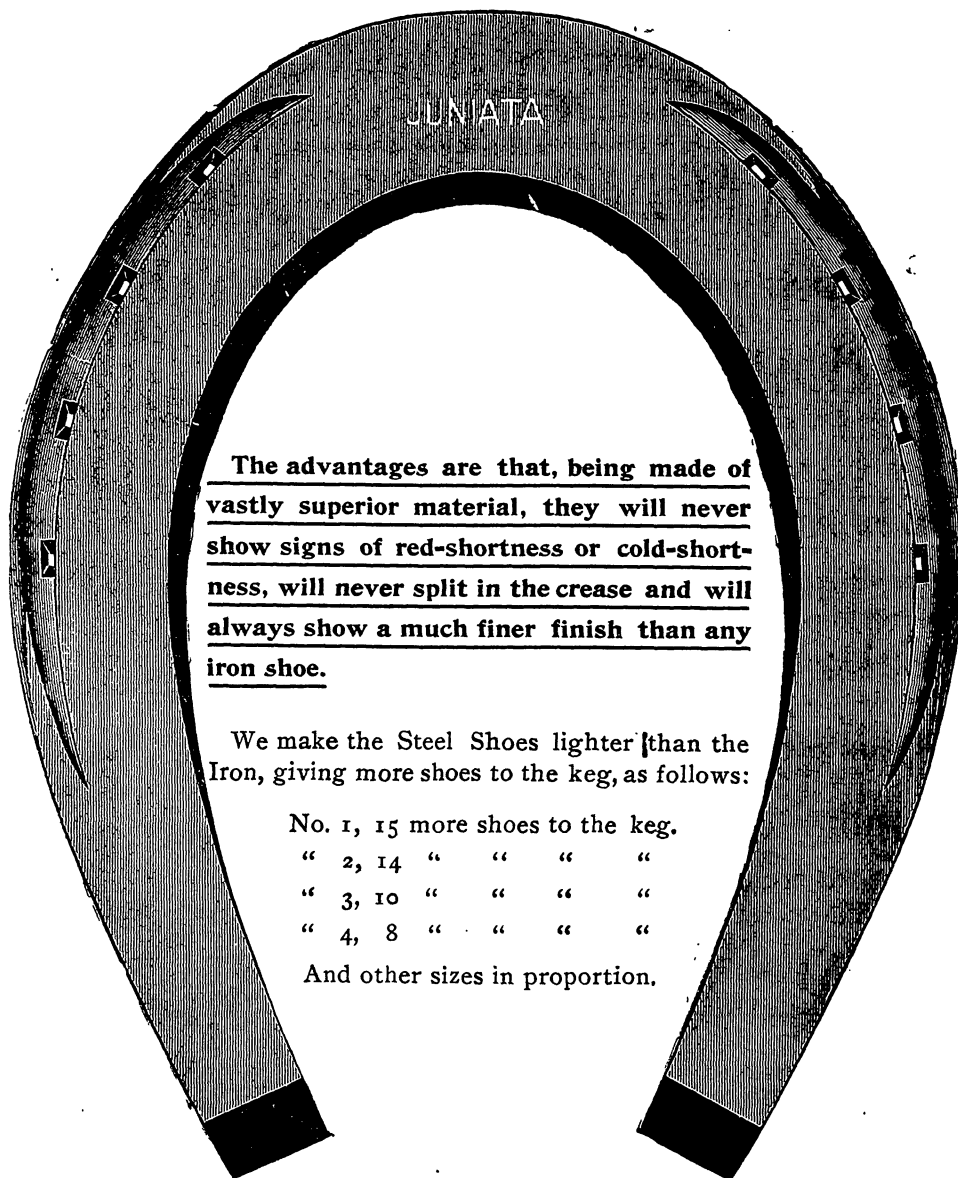
McKean and Meadow Sts.,

PHILADELPHIA, PA.

STEEL HORSE SHOES.

SHOENBERGER & CO., PITTSBURGH, PA.,

After numerous and costly experiments have succeeded in manufacturing a special quality of soft homogeneous steel, specially adapted to the manufacture of Horse and Mule Shoes, and are now making from this steel Extra Swaged, and Government Pattern Horse and Mule Shoes. They give the best of satisfaction everywhere and we furnish them to the trade at the same prices as the regular iron shoe sold by ourselves and our competitors. We are at present making our Roadster Pattern Horse Shoes out of Iron, but we will make them of Steel also within a short time.



The advantages are that, being made of vastly superior material, they will never show signs of red-shortness or cold-shortness, will never split in the crease and will always show a much finer finish than any iron shoe.

We make the Steel Shoes lighter than the Iron, giving more shoes to the keg, as follows:

No. 1, 15 more shoes to the keg.

" 2, 14 " " " "

" 3, 10 " " " "

" 4, 8 " " " "

And other sizes in proportion.

No. 2 EXTRA SWAGED FRONT.

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

We would also call your attention to our Improved Steel Toe Calk, equal to any in the market. To secure the best wearing qualities use sand or borax in welding on a calk and cool off at a dark red, or still better, cool off without plunging in water. We make sizes numbers 1, 2, 3, 4, 5 and 6, packed in 25-pound boxes.

Write to us for information and prices, or apply to jobbers and dealers, who sell them everywhere.

SHOENBERGER & CO.,

JUNIATA IRON AND STEEL WORKS - - - PITTSBURGH, PA.

SCRANTON FORGING CO.,

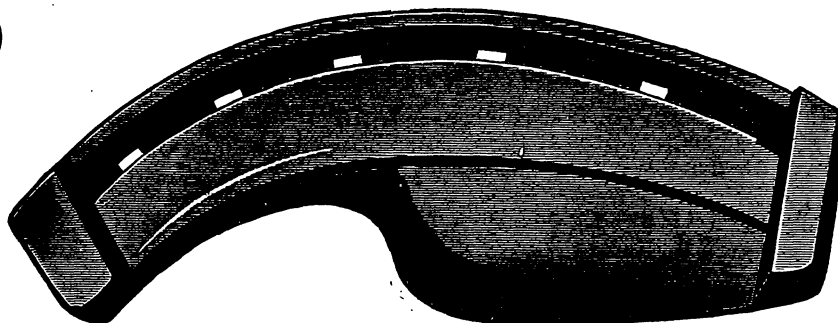
SCRANTON, PA.

CARRIAGE HARDWARE AND SPECIAL DROP FORGINGS.

FORGED

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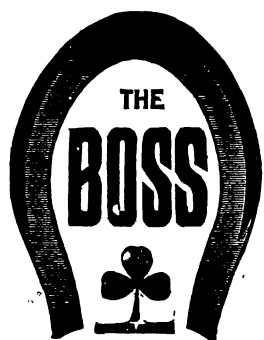
SHOES.



Made under Deebie's Patent, Aug. 9, 1887.

Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

IT IS JUST RIGHT.



HORSE AND MULE SHOES.

Superior Quality, Shape and Finish.

BRYDEN HORSE SHOE CO.,
CATASAUQUA, PA.

RHODE ISLAND PERKINS HORSE SHOE CO.,
MANUFACTURERS OF

Horse and Mule Shoes of the Perkins Pattern.

SPECIALTIES:—X L Steel Shoes, Toe Weight Shoes and Goodenough Shoes.
Works at Valley Falls, R. I. Office, 31 Exchange Place, Providence, R. I.
F. W. CARPENTER, Pres., C. H. PERKINS, Gen. Manager, B. W. COMSTOCK, Sec'y,
CHARLES R. STARK, Treas.

J. C. McCARTY & CO., Agents - 97 Chambers Street, New York.

THE NEW DIAMOND STATE HORSE AND MULE SHOES.

JUST TRY THEM and YOU will say they excel all others.
MANUFACTURED BY

DIAMOND STATE IRON CO.
WILMINGTON, DELAWARE.

Other "high grade" specialties in Rivets, Spikes, Splice Bars, Track and Machine Bolts, Blanks, Nuts, Stay Bolt Iron, Horse Shoe Iron, Bar Iron, &c.

PHILADELPHIA OFFICE,
206 So. Fourth St.

{Correspondence invited}

NEW YORK OFFICE,
11 Pine St.

Elegant Iron.

Beautiful Shape.

HORSE SHOES,
Light, Medium and Heavy.
MULE SHOES,
Light, Medium and Heavy.

Illustrated booklet and prices to all
parts of the world on application.

OLD DOMINION IRON AND NAIL WORKS CO.,
ARTHUR B. CLARKE, President.

Chicago Office, 45 La Salle St.

Richmond, Va., U. S. A.

BURDEN'S

HORSE SHOES.

"Burden Best"

Iron

Boiler Rivets.

The Burden Iron Co.

TROY, N. Y.

PHOENIX HORSE SHOES.

PHOENIX HORSE SHOE CO.,

ROLLING MILLS AND FACTORIES,

Poughkeepsie, N. Y.

Joliet, Ill.

NEW YORK OFFICE, No. 66 Reade St.

Standard Horse Shoe Co., Manufacturers of HORSE AND MULE SHOES.

LEEDS, ROBINSON & CO., General Agents,

4 Liberty Square, Boston, Mass.

HIGHEST AWARD
—AT—
World's Columbian Exposition.

In the tests submitted before the judges on awards
the Capewell No. 6 was shown to be 17 per cent. tougher
than No. 8 of other makes.

CAPEWELL HORSE NAILS,
—MADE BY—
THE CAPEWELL HORSE NAIL CO., - - - HARTFORD, CONN.

Office of D. C. BURNHAM,
Director of Works, World's Columbian Exposition,
JACKSON PARK, CHICAGO, ILL.

October 28, 1893.

TO THE CAPEWELL HORSE NAIL CO.:
*Gentlemen—I have used your horse nails here on the horses belonging
to the World's Columbian Exposition, and I think they are far supe-
rior to any others that I have ever used. As I have been in the
horseshoeing business for about twenty-five years, I know
what I am talking about.*

Very respectfully,
HERMAN J. HENKE,
Foreman Blacksmith, World's Colum-
bian Exposition.

The Capewell Patent Corrugated Horse Nail.

Needs No Clinching.

“The Best Driving Nail.”

“The Best Nail to Hold.”

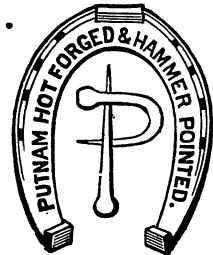
Highest Award

FOR

Supreme Excellence

TO

The PUTNAM Hot-Forged and Hammer-Pointed Horse NAILS,



At the *World's Columbian Exposition* at Chicago. A medal and diploma worded:
“Supreme excellence in material, method in manufacture, and quality of finished product; elasticity
and smoothness combined with holding power in clinch.
It allows the use of very small nails.”

There is nothing beyond “supreme excellence,” nor is there anything comprised in a horse nail, except the “material from which it is made,” “the method of manufacture,” and “quality of finished product.”
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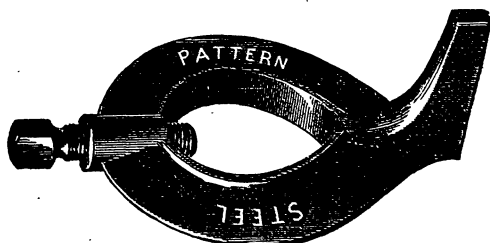
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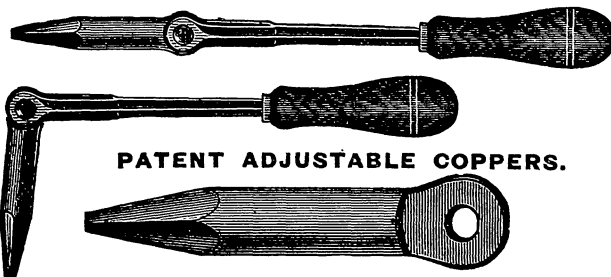
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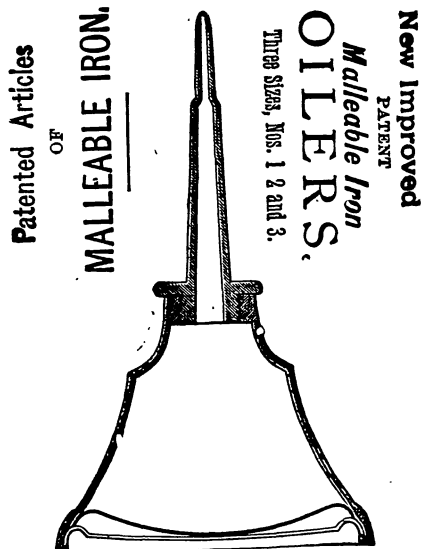
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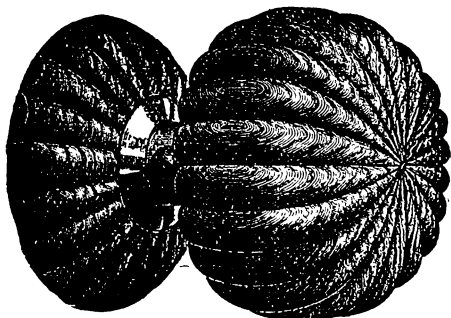
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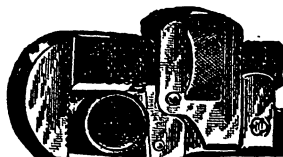
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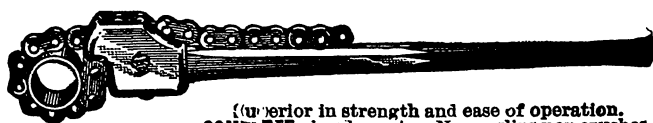
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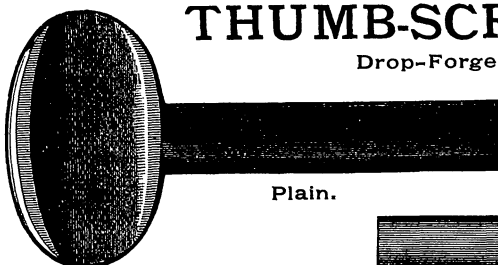
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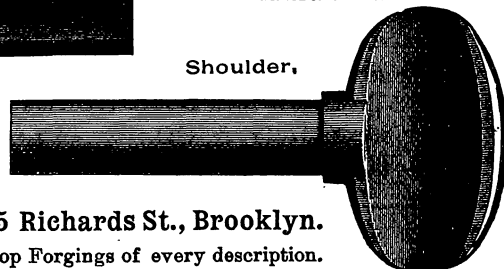
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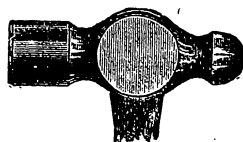
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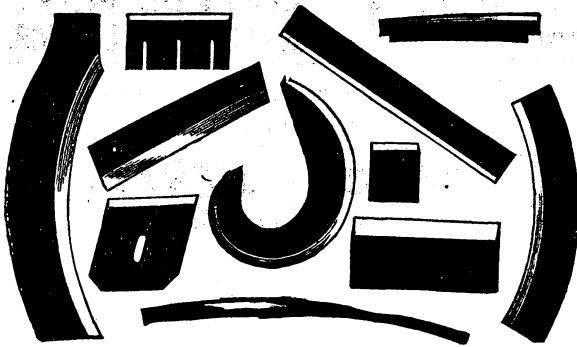
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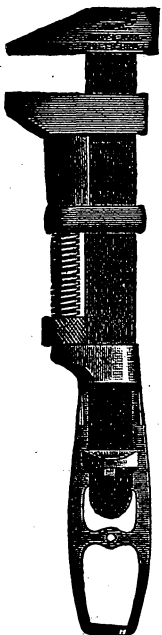
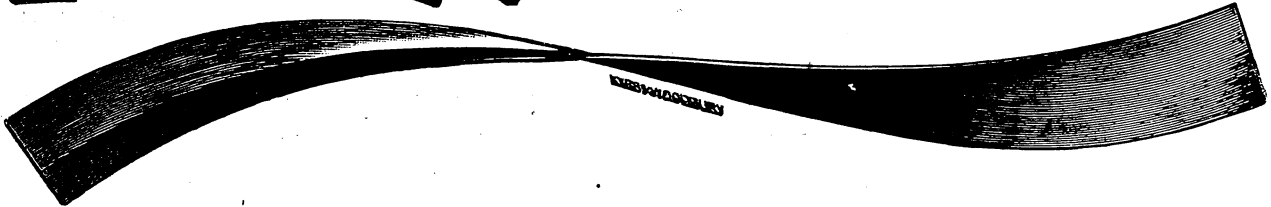
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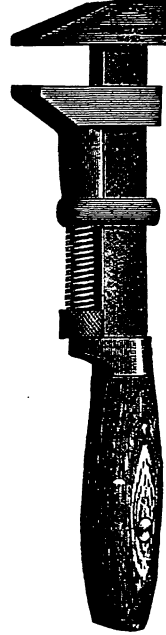
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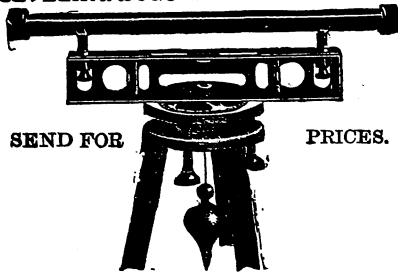
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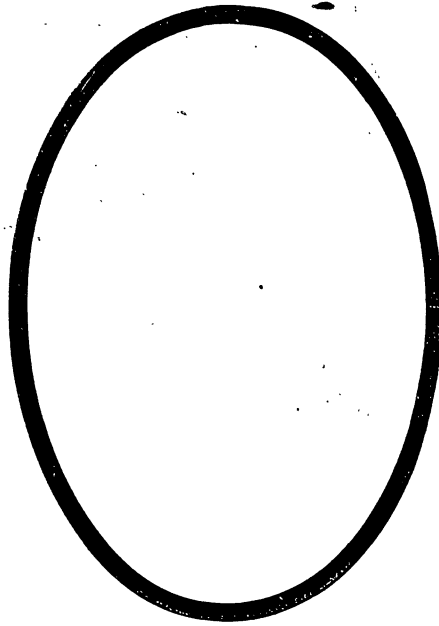
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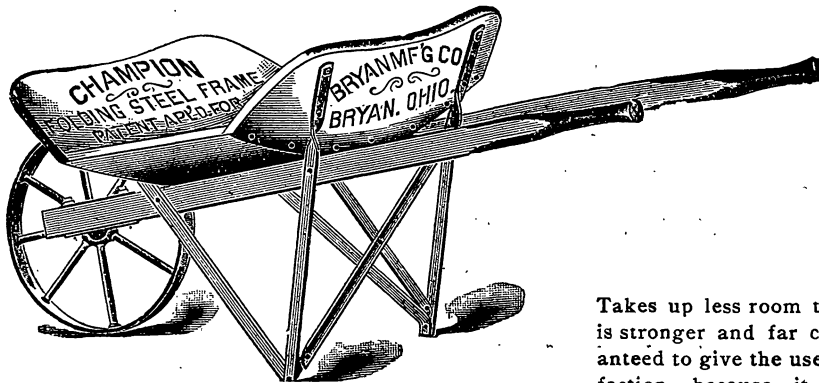


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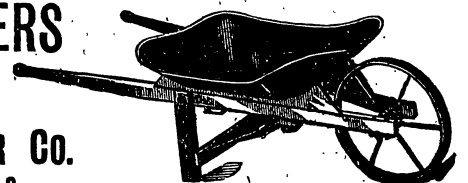
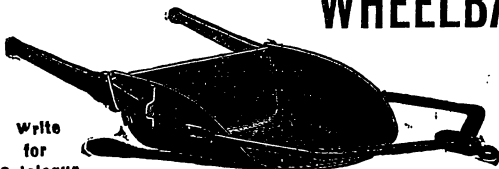
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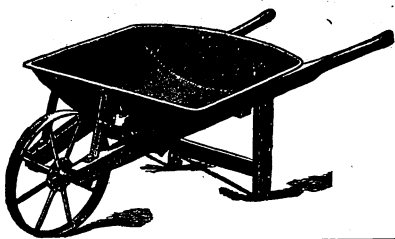
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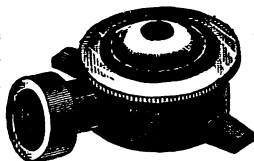
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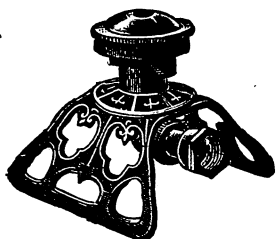
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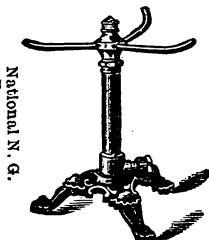
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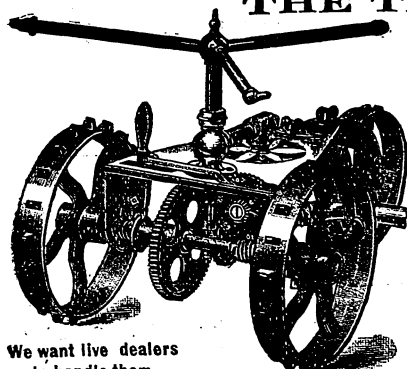
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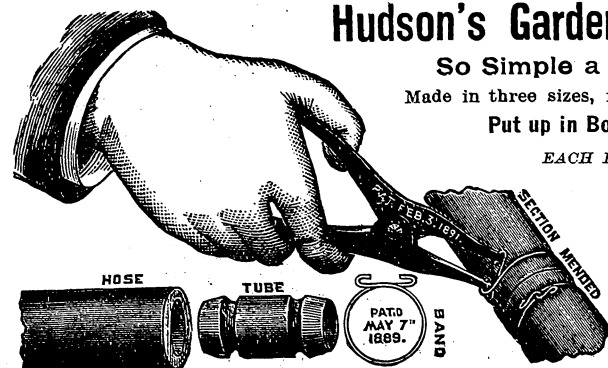
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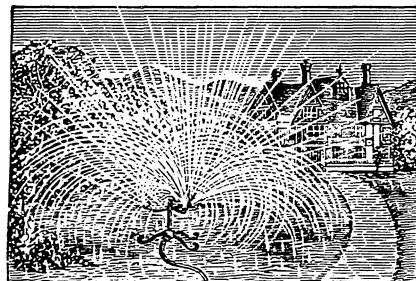
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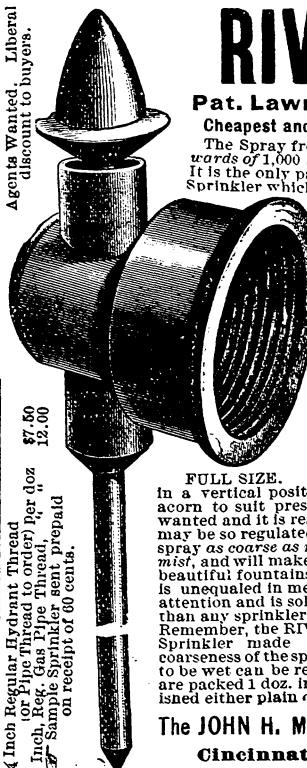
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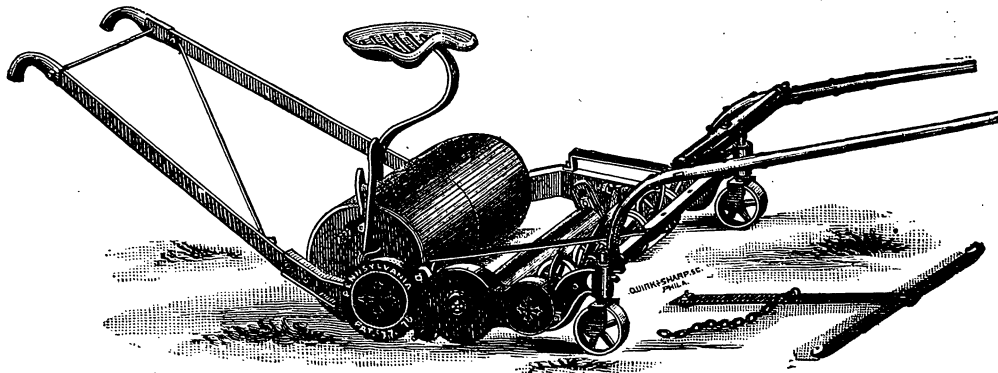
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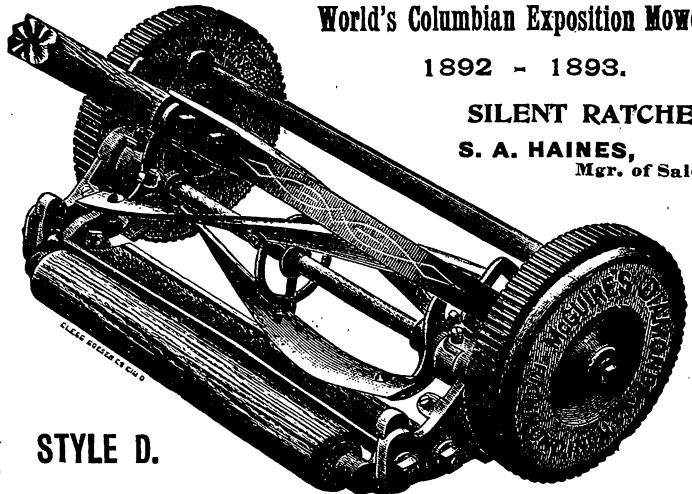
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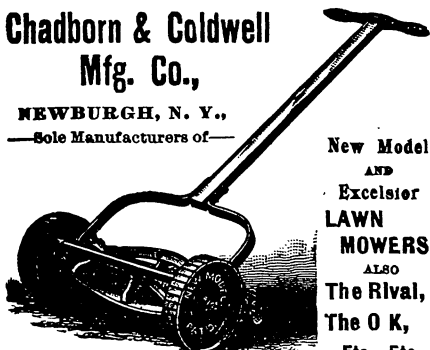


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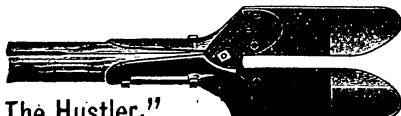
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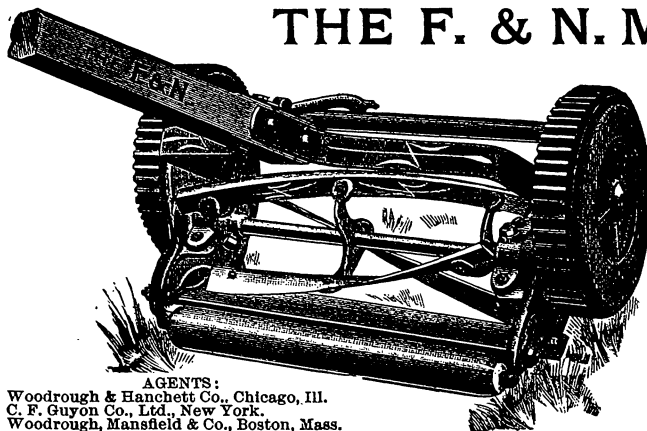


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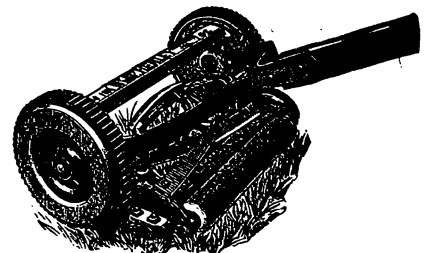
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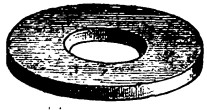
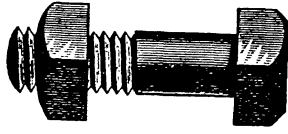
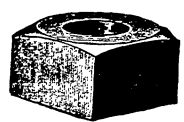
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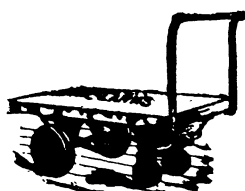
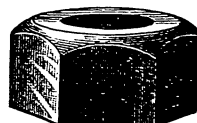
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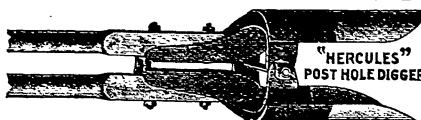
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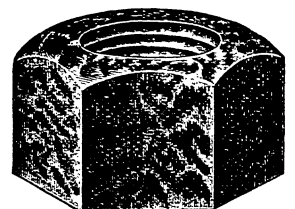
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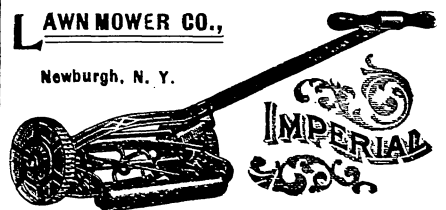


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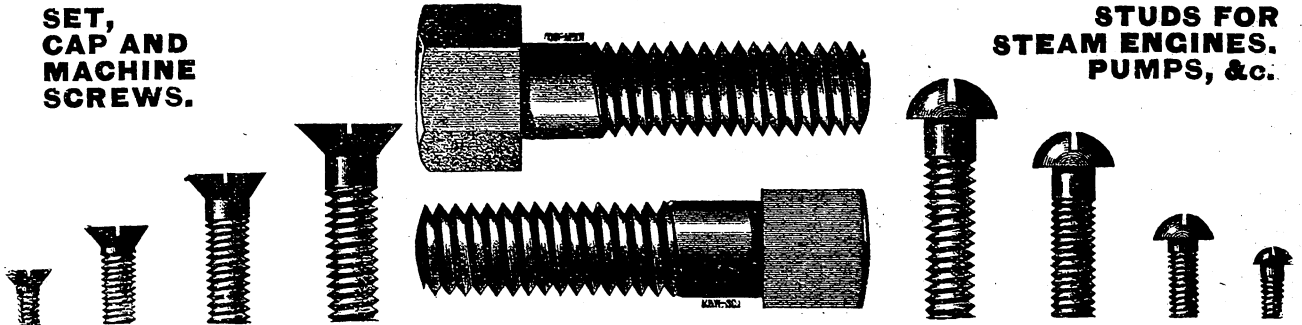
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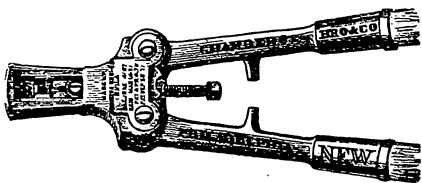
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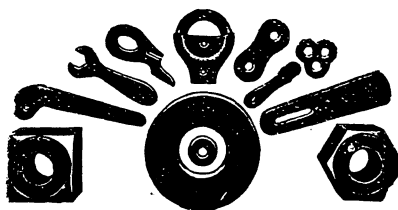
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Engines, Gas and Gasoline.

Buckeye Mfg. Co., Union City, Ind.
Otto Gas Engine Works, Phila., Pa.
Rollason Gas Engine, Havemayer
Bldg., N. Y.
Springfield Gas Engine Co., Springfield,
Ohio.

Engines, Steam, Makers of.

Bass Foundry & Machine Works, Ft.
Wayne, Ind.
Erie Engine Works, Erie, Pa.
Norwalk Iron Works Co., So Norwalk,
Conn.
Penna. Diamond Drill & Mfg. Co.,
Birdsboro, Pa.
Phila. Engineering Works, Phila., Pa.
Southwark Foundry & Machine Co.,
Phila., Pa.
Tod, William & Co., Youngstown, O.
Totten & Hogg Iron & Steel Fdry. Co.,
Pittsburgh, Pa.
Wetherill, Robt. & Co., Chester, Pa.

Exhaust Tumblers.

Sweetser, W. A., Brockton, Mass.

Expansion Bolts.

Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.
Steward & Romaine Mfg. Co., Phila.,
Pa.

Faucets, Self-Measuring.

Lane Bros., Poughkeepsie, N. Y.

Faucets, Wooden, Makers of.

John Sommer's Son, Newark, N. J.

Feed-Water Heaters and Purifiers.

Davis, I. B. & Son, Hartford, Conn.
Goubert Mfg. Co., 32 Cortlandt St., N. Y.
Harrison Safety Boiler Works, Phila.,
Pa.
National Pipe Bending Co., New
Haven, Conn.
Taunton Locomotive Mfg. Co., Taun-
ton, Mass.
Webster, Warren & Co., Camden, N. J.
Whitlock Coll Pipe Co., Elmwood,
Conn.

Fencing, Iron and Wire.

Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Cleveland Fence Co., Indianapolis, Ind.
Clinton Wire Cloth Co., Clinton, Mass.
Hilbert & Bennett Mfg. Co., 42 Cliff St.
Kilmer Mfg. Co., Newburgh, N. Y.
Mast, Foss & Co., Springfield, O.
Randall Fence Co., Le Roy, N. Y.
The Van Dorn Iron Works Co., Cleve-
land, O.

Files, Importers of.

Moss, F. W., 80 John St., N. Y.

Files and Rasps, Manufacturers of.

Arcade File Works, Anderson, Ind.
Banker & White, Troy, N. Y.
Barnett, G. & H., 41 & 43 Richmond,
Phila.
McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence, R. I.

Fire Brick, Makers of.

Borgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischner, B. & Sons, foot E. Houston
St., N. Y.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. D. & Bro., Woodbridge.

Fishing Tackle.

Dame, Stoddard & Kendall, Boston,
Mass.

Flint and Emery Paper.

Baeder, Adamson & Co., Phila., Pa.

Flour Sifters.

Bromwell Brush & Wire Goods Co.,
Cincinnati, Ohio.

Flue Cleaners.

Mackey, Jas. T., St. Louis, Mo.

Fodder Cutters.

Silver Mfg. Co., Salem, O.

Forges, Portable, &c.

Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lan-
caster, Pa.
Sturtevant, B. F. Co., Boston, Mass.

Forgings, Iron and Steel.

Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co.,
Johnstown, Pa.
Frankford Steel Co., Phila., Pa.
Scranton Forging Co., Scranton, Pa.
U. S. Projectile Co., Brooklyn, N. Y.

Forks, Hay and Manure.

Iowa Farming Tool Co., Ft. Madison,
Iowa.

Foundry Facings.

Dixon, Jos., Crucible Co., Jersey City,
N. J.
S. Obermayer Co., Cincinnati, O.
Smith, J. D., Fdy. Supply Co., Cin., O.

Foundry Riddles.

Estey, W. S., 65 Fulton, N. Y.

Foundry Supplies.

Diamond Clamp & Flask Co., Rich-
mond, Ind.
S. Obermayer Co., Cincinnati, O.
Rice Mfg. Co., New Durham, N. H.
Smith, J. D., Fdy. Supply Co., Cin., O.

Friction Clutches.

Brown, A. & F., 17 Deay St., N. Y.
Keystone Clutch & Mch. Wks., Phila.,
Pa.
Moore & White Co., Philadelphia, Pa.

Friction Cone.

Evans Friction Cone Co., Boston, Mass.

Galvanized Material.

Jersey City Galvanizing Co., 112 John
St., N. Y.

Gas Producers.

Wood, R. D. & Co., Philadelphia, Pa.

Galvanizing Kettles.

Sands, Thos., Nashua, N. H.

Gas & Steam Fitters' Supplies.

Pancoast, Henry B. & Co., Phila., Pa.

Gate Hinges.

Wrightsville Hdw. Co., Wrightsville,
Pa.

Gauge, Rolling Mill.

Haines Gauge Co., Philadelphia, Pa.

Gear Cutters.

D. E. Whiton Mach. Co., New London,
Conn.

Gears.

Boston Gear Works, Boston, Mass.
Gleason Tool Co., Rochester, N. Y.
Lincoln Iron Works, Rutland, Vt.
Poole, Robt. & Son Co., Baltimore,
Md.
U. S. Projectile Co., Brooklyn, N. Y.

Glass Cutters.

Monce, S. G., Bristol, Conn.

Glue.

Baeder, Adamson & Co., Phila., Pa.
Dodd, A. W. & Co., Gloucester, Mass.
Russia Cement Co., Gloucester, Mass.

Grass Catchers.

Supplee Hardware Co., Phila., Pa.

**Grinding and Polishing Ma-
chines.**

Norton Emery Wheel Co., Worcester,
Mass.

Grindstone Dressing Machinery.

Blake & Johnson, Waterbury, Conn.

Grindstones.

Cleveland Stove Co., Cleveland, O.

Gunpowder, Makers of.

Latini & Rand Powder Co., 29 Murray
St., N. Y.

Handles.

Cleveland Wood Turning Co., Cleve-
land, O.

Hangers, Door.

Coburn Trolley Track Mfg. Co.,
Holyoke, Mass.
Lane Bros., Poughkeepsie, N. Y.

Hardware Comm'n Merchants.

Graham, John H. & Co., 111 Chambers
St., New York.
Jacobus, W. H., 90 Chambers, N. Y.

Hardware Manufacturers.

Stearns, E. C. & Co., Syracuse, N. Y.
Streeter, N. B. & Co., Groton, N. Y.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford
Conn.

Hardware Mfrs.' Agents.

Bingham, W. Co., Cleveland, O.
Clarke, Thomas, St. John, N. B.
Graham, John H. & Co., 113 Chambers.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Hardware Specialties.

Acme Shear Co., Bridgeport, Conn.
Berger Bros., Philadelphia, Pa.
Bourke Mfg. Co., Youngstown, O.
Enterprise Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Haines & Zimmermann, Phila., Pa.
Johnson, S. C., Racine, Wis.

**New Britain Hdw. Mfg. Co., New Brit-
ain, Conn.**

North Bros. Mfg. Co., Philadelphia, Pa.
Scranton & Co., New Haven, Conn.
Shepard, Sidney & Co., Buffalo, N. Y.
Wilson, J. Fred., Worcester, Mass.
Wrightsville Hdw. Co., Wrightsville,
Pa.

Harness Snaps.

Covert Mfg. Co., West Troy, N. Y.
Coverts' Saddlery Wks. Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.

Hoisting Machines.

Box, Alfred & Co., 314 Green, Phila.
Brown Hoisting & Conveying Mch. Co.,
Cleveland, Ohio.
Fulton Iron & Engine Wks., Detroit,
Mich.

Harrington, E. Son & Co., Phila.

Lane Bros., Poughkeepsie, N. Y.
Lidgerwood Mfg. Co., 96 Liberty, N. Y.
Lincoln Iron Works, Rutland, Vt.
McCoy, Jos. F. & Co., 26 Warren St.
Maris & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee,
Wis.
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Speldel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.

Hollow Ware.

Avery Stamping Co., Cleveland, O.
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleve-
land, O.

Hollow Ware, Aluminum.

Wohler Aluminum Co., Chicago, Ill.

Horse Nails, Makers of.

Capewell Horse Nail Co., Hartford,
Conn.
National Horse Nail Co., Vergennes,
Vt.
Putnam Nail Co., Neponset, Boston,
Mass.

Horse and Mule Shoes, Makers of.

Bryden Horse Shoe Co., Catsaqua,
Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max
Meadows, Va.
Diamond State Iron Co., Wilmington,
Del.
Old Dominion Iron & Nail Works Co.,
Richmond, Va.
Phoenix Horse Shoe Co., Poughkeep-
sie, N. Y.
Rhode Island Perkins Horse Shoe Co.,
Providence.
Shoenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston,
Mass.

Hose Menders.

Hudson, C. E. & Co., Leominster,
Mass.
Jones, M. D. & Co., Boston, Mass.

Hose.

N. Y. Belting & Packing Co., Ltd., 15
Park Row, N. Y.

Hydrants, &c.

McLean, John, 296 & 298 Monroe, N. Y.

Hydraulic Forging.

U. S. Projectile Co., Brooklyn, N. Y.

Hydraulic Jacks.

Dudgeon, Richard, 24 Columbia, N. Y.
McCoy, Jos. F. Co., 26 Warren St., N. Y.

Ice Breakers.

Clement & Dunbar, Philadelphia, Pa.
Parker, Chas. Co., Meriden, Conn.

Ice Cream Freezers.

Clement & Dunbar, Phila., Pa.
North Bros. Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
White Mountain Freezer Co., Nashua,
N. H.

Injectors.

Exon-Evans Mfg. Co., Philadelphia,
Pa.
Jenkins Bros., New York.

Insurance, Boiler.

Hartford Steam Boiler Inspection &
Insurance Co., Hartford, Conn.

Iron and Steel, Swedish.

Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.

Iron Commission Brokers.

Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Barclay W. & Co., Phila.
Etting, Edw. J., Philadelphia.
Hogab, John L. & Co., Philadelphia, Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keely, Jerome & Co., Philadelphia.
Lea, J. Tatnall & Co., Philadelphia.
Mohr, J. J., 430 Walnut, Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Wister, L. & R. Co., Phila., Pa.

Iron Ore.

Samuel, Frank, Philadelphia, Pa.

Iron, Merchants.

Barns, C. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N. Y.
Bussenius & Cunliffe, Philadelphia.
Corning, Edw. & Co., 29 B'way, N. Y.
Cox, Justice, Jr., Philadelphia.
Cotton, Barclay W. & Co., Phila.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 446 West St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 577 to 583 Green-
wich St., N. Y.
Pierson & Co., 29 Broadway, N. Y.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., 66 B'way, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.

Iron, Importers.

Abbott Wheelock & Co., N. Y. and
Boston.
Lundberg, Gustaf, Boston, Mass.

Iron, Sheet, Manufacturers of.

Cambridge Iron & Steel Co., Cam-
bridge, Ohio.
W. Dewees Wood Co., Lim., McKees
port, Pa.

Ironwork, Ornamental.

Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleve-
land, O.

Keys.

Wollensak, J. F., Chicago, Ill.

Knife and Tool Grinders.

Tracy, A. J. Co., Ltd., 18 Cliff St., N. Y.

Ladles.

Detroit Fdy. Equipment Co., Detroit,
Mich.

Lanterns.

Rochester Lamp Co., 42 Park Place,
New York.
Steam Gauge & Lantern Co., Syracuse,
N. Y.

Lathes.

Dietz, Schumacher & Co., Cincinnati, O.
Draper Machine Tool Co., Worcester,
Mass.
Harrington, E. Son & Co., Phila., Pa.
Johnson, Israel H., Jr. & Co., Phila-
delphia, Pa.
New Haven Mfg. Co., New Haven, Conn.
Sebastian Lathe Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls,
N. Y.

Lathing, Wire.

Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Wor-
cester, Mass.

Laundry Machines.

Johnson, S. C., Racine, Wis.

Lawn Mowers.

Blair Mfg. Co., Springfield, Mass.
Chadborn & Coldwell Mfg. Co., New
burg, N. Y.
Coldwell Lawn Mower Co., Newburg,
N. Y.
Dille & McGuire Mfg. Co., Richmond,
Ind.
Enterprise Mfg. Co., Philadelphia, Pa.
F. & N. Mfg. Co., Richmond, Ind.
Henley, M. C., Richmond, Ind.
Mast, Foss & Co., Springfield, O.
Supplee Hdw. Co., Phila., Pa.

Lawn Rakes.

Gibbs Mfg. Co., Canton, Ohio.
Kohler, F. E. & Co., Canton, O.

Lawn Sprinklers.

Blair Mfg. Co., Springfield, Mass.
Enterprise Mfg. Co., Phila., Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Gibbs Mfg. Co., Canton, Ohio.
McGowan, John H. Co., Cincinnati, O.
Portland Lawn Sprinkler Co., Port-
land, Me.

Lemon Squeezers.

Ripley Mfg. Co., Unionville, Conn.

Letters and Figures, Metallic.

White, A. A. & Co., Providence, R. I.

Letters, Paper.

Tablet & Ticket Co., Chicago, Ill.

Levels.

Richardson, C. F. & Son, Athol, Mass

Locks and Knobs, Manufacturers of

Deitz, A. E., 97 Chambers, N. Y.
Independent Electric Co., Chicago, Ill.
Reading Hdw. Co., Reading, Pa.
Smith & Egge Mfg. Co., Bridgeport,
Conn.
Yale & Towne Mfg. Co., Stamford,
Conn.

Lubricants.

Dixon, Jos., Crucible Co., Jersey City
N. J.

Machinery.

Am. Tool Works, Cleveland, Ohio.
Ayer, H. C. & Gleason Co., Phila., Pa.
Barnes, W. F. & Joh., Rockford, Ill.
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. E., 45 De., N. Y.
Bisnall & Keeler Mfg. Co., St. Louis.
Bliss, E. W. Co., Brooklyn, N. Y.
Bridgeport Mch. Tool- Works, Bridge-
port, Conn.
Briggs, Marvin, 12 Broadway, N. Y.
Carlin's Sons, Thos., Allegheny, Pa.
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.
Detrick & Harvey Mch. Co., Balti-
more, Md.
Dietz, Schumacher & Co., Cincinnati,
Ohio.
Fitchburg Mch. Works, Fitchburg,
Mass.
Garvin Mch. Co., Light & Canal Sts.
Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila., Pa.
Henderer, A. L., Wilmington, Del.
Hendey Machine Co., Torrington, Ct.
Hill, Clarke & Co., Boston, Mass.
Howard & Morse, 45 Fulton St., N. Y.
Hubb-Rogers Mch. Co., South Sud-
bury, Mass.
Johnson, Israel H., Jr. & Co., Phila.
Jones & Lamson Mch. Co., Spring-
field, Vt.
Lodge & Davis Mch. Tool Co., Cin-
cinnati, O.
Lodge & Shipley Mch. Tool Co., Cin-
cinnati, O.
Lovegrove & Co., Philadelphia, Pa.
McCabe, J. J., 68 Cortlandt, N. Y.
Machinists' Supply Co., Rochester,
N. Y.
Manville, E. J., Mch. Co., Waterbury
Conn.
Newark Mch. Tool Wks., Newark, N. J.
New Haven Mfg. Co., New Haven, Ct.
New York Machinery Depot, 178 Broad-
way, New York.
Niles Tool Wks., 138 Liberty St., N. Y.
Pittkin, A. B. Machinery Co., Provi-
dence, R. I.
Pittsburgh Mfg. Co., Pittsburgh, Pa.

- Place, Geo., 145 Broadway, N. Y.
 Poole, Robt. & Son Co., Baltimore, Md.
 Powell Planer Co., Worcester, Mass.
 Pratt & Whitney Co., Hartford, Conn.
 Prentiss Tool & Supply Co., N. Y.
 Scranton Supply & Mchry. Co., Scranton, Pa.
 Sellers, Wm. & Co., Phila.
 Seyfer's Sons, L. F., Philadelphia, Pa.
 Sigourney Tool Co., Hartford, Conn.
 Steptoe, J. & Co., Cincinnati, O.
 Stow Flexible Shaft Co., Ltd., Phila.
 Toomey, Frank, Philadelphia, Pa.
 Wetherill, Robert & Co., Chester, Pa.
 Wickes Bros., Saginaw, Mich.
 Wilson, W. A., Rochester, N. Y.
- Machinery for Hardware Manufacturers.**
 Add. Jno. & Son, New Haven, Conn.
- Machine Knives.**
 Loring, Coes & Co., Worcester, Mass.
 Simonds Mfg. Co., Fitchburg, Mass.
 New Britain Hdw. Mfg. Co., New Britain, Conn.
- Machine Screws.**
 New Britain Hdw. Mfg. Co., New Britain, Conn.
- Machine Tools.—See Machinery.**
- Machine Work.**
 Papping, J., 58th St. & 11th Ave., N. Y. City.
- Machinists' Scales.**
 Coffin & Leighton, Syracuse, N. Y.
 Starrett, L. S., Athol, Mass.
- Machinists' Tools and Supplies.**
 King, J. M. & Co., Waterford, N. Y.
 Sellers, Wm. & Co., Inc., Phila.
- Mangles.**
 Johnson, S. C., Racine, Wis.
- Manufacturing Sites.**
 Illinois Central R. R., Chicago, Ill.
- Measuring Tapes.**
 Keuffel & Esser Co., N. Y.
 Lufkin Rule Co., Saginaw, Mich.
- Meat Choppers.**
 Clauss Shear Co., Fremont, Ohio.
- Mechanical Instruction.**
 Correspondence School of Mechanics, Scranton, Pa.
- Metals.**
 Fearing, Wm. S., 100 Chambers, N. Y.
 Hendricks Bros., 49 Cliff, N. Y.
- Metal Brokers.**
 American Metal Co., N. Y.
- Metallurgists.**
 Britton, J. Blodgett, Phila., Pa.
- Mincing Knives.**
 Palmer Hdw. Mfg. Co., Troy, N. Y.
- Mine Lamps.**
 Darby, Edw. & Sons, Phila., Pa.
 Leonard, B. E., Scranton, Pa.
- Mining Screens.**
 Harrington & King Perforating Co., Chicago, Ill.
 Howard & Morse, 45 Fulton, N. Y.
- Models, Makers of.**
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.
 Ideal Machine Works, Hartford, Conn.
- Molding Sand.**
 Obermayer, S. Co., Cincinnati, O.
- Motors, Water and Electric.**
 C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
 Dallett, Thomas H. & Co., Phila., Pa.
- Nail Machinery.**
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail and Tack Pullers.**
 Scranton & Co., New Haven, Conn.
 Specialty Mfg. Co., Hartford, Conn.
- Nails (Cut) and Spikes.**
 Borden & Lovell, 70 West, N. Y.
 Cumberland Nail & Iron Co., Phila.
 Pottstown Iron Co., Pottstown, Pa.
 Riverside Iron Wks., Wheeling, W. Va.
- Nickel Plating.**
 Rhodes, L. E. Co., Hartford, Conn.
- Norway Shapes, Rollers of.**
 Rowland, William & Harvey, Frankford, Philadelphia.
- Novelty Manufacturers.**
 Franklin, H. H. Mfg., Syracuse, N. Y.
 Ideal Machine Works, Hartford, Conn.
 Ransom Hdw. Co., Burlington, Vt.
- Nut Machines.**
 Dunham Nut Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**
 American Bolt Co., Lowell, Mass.
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Dunham Nut Co., Unionville, Conn.
 Haskell, Wm. H. Co., Pawtucket, R. I.
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.
 Port Chester Bolt & Nut Co., Port Chester, N. Y.
 Russell, Burdall & Ward, Port Chester, N. Y.
 Sternbergh, J. H. & Son, Reading, Pa.
 Wilson, J. Fred., Worcester, Mass.
 Wm. H. Haskell Co., Pawtucket, R. I.
- Oilers.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Oil Stones.**
 Pike Mfg. Co., Pike Station, N. H.
- Ores.**
 Wister, Francis, Philadelphia, Pa.
- Ox Shoes.**
 Scranton Forging Co., Scranton, Pa.
- Packing.**
 Morrison, Robert, St. Louis, Mo.
 N. Y. Belting & Packing Co., Ltd., N. Y.
- Padlocks.**
 Ames Sword Co., Chicopee, Mass.
 Fraim, E. T., Lancaster, Pa.
 Independent Electric Co., Chicago, Ill.
 Shultz Mfg. Co., Phila., Pa.
 Wolf, W. & L., Phila., Pa.
- Paint Burners.**
 Dangler Stove & Mfg. Co., Cleveland, Ohio.
- Paint Cans.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Pants Stretcher.**
 Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors.**
 Butler, C. N., Phila., Pa.
 Jenner, H. W. T., Washington, D. C.
 Howson & Howson, Philadelphia and Washington.
 Stocking, E. B., Washington, D. C.
- Pattern Letters.**
 Wells, Heber, 157 William St., N. Y.
- Perforated Metal.**
 Clinton Wire Cloth Co., Clinton, Mass.
 Harrington & King Perforating Co., Chicago, Ill.
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Phosphor Bronze.**
 Phosphor Bronze Smelting Co., Limited, Philadelphia.
- Phosphor Tin.**
 Crescent Phosphorized Metal Co., Philadelphia, Pa.
 Halk & Naumann, 516 Pearl, N. Y.
- Picks and Mattocks.**
 Plumb, Fayette R., Philadelphia, Pa.
- Pig Iron.**
 Houston, C. B. & Co., Philadelphia, Pa.
 Montour Iron & Steel Co., Danville, Pa.
 Naylor & Co., 45 Wall, N. Y.
 Pilling & Crane, Philadelphia, Pa.
 Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**
 Am. Pig Iron Storage Warehouse Co., 44 Wall, N. Y.
- Pile Drivers.**
 Vulcan Iron Works, Chicago, Ill.
- Pipe, Bent.**
 National Pipe Bending Co., New Haven, Conn.
- Pipe Cutting and Threading Machines.**
 Armstrong Mfg. Co., Bridgeport, Conn.
 Bignall & Keeler Mfg. Co., St. Louis, Mo.
 Detrick & Harvey Mch. Co., Baltimore, Md.
 Merrill Mfg. Co., Toledo, O.
 Pancoast, Henry B. & Co., Phila.
 Saunders' Sons, D. Yonkers, N. Y.
 Walworth Mfg. Co., Boston, Mass.
- Pipe Grips.**
 Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**
 McNab & Harlin Mfg. Co., N. Y.
- Pipe, Water and Gas, Makers of.**
 Cumberland Nail & Iron Co., Phila., Pa.
 Donaldson Iron Co., Emaus, Pa.
 Riverside Iron Works, Wheeling, W. Va.
 Wood, R. D. & Co., Philadelphia, Pa.
- Plane Irons, Manufacturers of.**
 Buck Bros., Millbury, Mass.
 Buck, Chas., Millbury, Mass.
- Planers.**
 Detrick & Harvey Mch. Co., Baltimore, Md.
 New Haven Mfg. Co., New Haven, Conn.
 Powell Planer Co., Worcester, Mass.
 Wilson, W. A., Worcester, Mass.
- Planes, Manufacturers of.**
 Stanley Rule & Level Co., N. Y.
- Plated Ware.**
 Boardman, L. & Son, New Haddam, Ct.
 Holmes & Edwards Silver Co., Bridgeport, Conn.
 Rogers, Wm. Mfg. Co., Hartford, Ct.
- Plate, Iron and Steel, Mfrs. of.**
 Atna-Standard Iron & Steel Co., Bridgeport, O.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Mahoning Valley Iron Co., Youngstown, Ohio.
 Moorhead-McLean Co., Pittsburgh, Pa.
 McIlvain & Sons, Reading, Pa.
 Pottstown Iron Co., Pottstown, Pa.
 Pottsville Iron & Steel Co., Pottsville, Pa.
 Singer, Nisnick & Co., Pittsburgh, Pa.
 The Mahoning Valley Iron Co., Youngstown, O.
 Wood, Alan Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Polishing Machines.**
 Watson & Stillman, 204 E. 43d, N. Y.
- Post Hole Diggers.**
 Gibbs Mfg. Co., Canton, Ohio.
 Kohler, F. E. & Co., Canton, O.
- Poultry Nettings.**
 Barnum, E. T., Detroit, Mich.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
 N. J. Wire Cloth Co., Trenton, N. J.
 "Silver Finish."
 Tyler Wire Works Co., W. S., Cleveland, O.
 Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**
 Ladin & Rand Powder Co., 29 Murray, New York Powder Co., 62 Liberty St., N. Y.
- Power Hack Saws.**
 Millers Falls Co., 93 Reade St., N. Y.
- Power Hammers.**
 Dielent & Elsenhardt, Philadelphia.
 Dupont Mfg. Co., St. Johnsbury, Vt.
 Jenkins & Linkle, Bellefonte, Pa.
 Long & Allstatter Co., Hamilton, Ohio.
 Scranton & Co., New Haven, Conn.
- Power Transmitting Machinery.**
 Dodge Mfg. Co., Mishawaka, Ind.
- Presses, Dies, &c.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Mch. Co., Waterbury, Ct.
- Presses, Power, Makers of.**
 Bliss, E. W. Co., Brooklyn, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Merriman, A. H., Meriden, Conn.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
- Pulleys.**
 Brown, A. & F., 17 Dey St., N. Y.
 Dodge Mfg. Co., Mishawaka, Ind.
 Keystone Clutch Mch. Wks., Phila., Pa.
 Lake, J. H. & D. Co., Massillon, O.
- Pulverizing Mills.**
 Bradley Fertilizer Co., Boston, Mass.
- Pumping Machinery.**
 Dean Bros. Steam Pump Works, Indianapolis, Ind.
 Hooker-Colville Steam Pump Co., St. Louis, Mo.
 McGowan, J. H. & Co., Cincinnati, O.
 Maslin, J. & Son, Jersey City, N. J.
 Norwalk Iron Works Co., So. Norwalk, Conn.
 Southwark Fdy. & Mch. Co., Phila., Pa.
 Valley Pump Works, Easthampton, Mass.
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.
- Pumps, Makers of.**
 Bellevue Pump Co., Bellevue, Iowa.
 Deming Co., Salem, O.
 Douglas, W. B., Middletown, Conn.
 Mast, Foss & Co., Springfield, O.
 Myers, F. E. & Bro., Ashland, O.
- Punches.**
 Richards, I. P., Providence, R. I.
- Punches and Shears, Hand and Power.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Fender, A. L., Wilmington, Del.
 Long & Allstatter Co., Hamilton, Ohio.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
 Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**
 Perry, W. H. & Co., Providence, R. I.
- Rat and Mouse Traps.**
 Estey, W. S., 65 Fulton, N. Y.
 Ripley Mfg. Co., Unionville, Conn.
- Razor Guard.**
 Murphy, P. D., Lockport, N. Y.
- Razors, Manufacturers of.**
 Torrey, J. R. Razor Co., Worcester, Mass.
- Reels.**
 Hendryx, A. B. Co., New Haven, Conn.
- Refrigerator Door Fasteners.**
 Conroy, P. J. & Co., Philadelphia.
- Rivets.**
 Blake & Johnson, Waterbury, Conn.
 Boyce Rivet Co., Muncie, Ind.
 Burden Iron Co., Troy, N. Y.
 Clark & Cowles, Plainville, Conn.
 Cobb & Drew, Plymouth, Mass.
 Sternbergh, J. H. & Son, Reading, Pa.
 Townsend, W. P. & Co., New Brighton, Pa.
- Riveting Machines.**
 Add. Jno. & Son, New Haven, Conn.
- Rolling Mill Machinery.**
 Birmingham Iron Fdry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.
 Leachway Foundry & Mch. Co., Pittsburgh, Pa.
 Morgan Construction Co., Worcester, Mass.
 Robinson-Rea Mfg. Co., Pittsburgh.
 Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.
 Trethewey Mfg. Co., Pittsburgh, Pa.
 Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.
- Rolls, Chilled, Sand and Steel.**
 Birmingham Iron Foundry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.
 East Chicago Fdry Co., Chicago, Ill.
 Garrison, A. Fdry. Co., Pittsburgh, Pa.
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.
 Seaman, Sleeth & Black, Pittsburgh.
 Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.
- Roofing.**
 Cambridge Roofing Co., Cambridge, O.
 Cincinnati Corrugating Co., Piqua, O.
 Kanberg Roofing Co., Canton, O.
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
- Rope and Web Goods.**
 Covert Mfg. Co., West Troy, N. Y.
 Covert's Saddlery Wks., Farmer, N. Y.
- Rope Wheels.**
 Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**
 Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**
 Keuffel & Esser Co., New York.
 Lufkin Rule Co., Saginaw, Mich.
 Stanley Rule & Level Co., 29 Chambers.
- Rust Preventive.**
 Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.
- Sad Irons.**
 Streeter, N. R. & Co., Groton, N. Y.
- Sand Paper.**
 Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**
 Caldwell Mfg. Co., Rochester, N. Y.
 Fullman Sash Balance Co., Rochester, N. Y.
 Stearns, E. C. & Co., Syracuse, N. Y.
- Sash Cords and Chains.**
 Morton, Thos., 45 Elizabeth, N. Y.
 Ossawam Mills Co., Norwich, Conn.
 Samson Cordage Works, Boston, Mass.
 Smith & Egge Mfg. Co., Bridgeport.
- Sash Pulleys.**
 Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**
 Brown, E. E. & Co., Philadelphia, Pa.
 Norton Bros., Chicago, Ill.
- Saw Filing Machines.**
 Disston, Henry & Sons, Philadelphia, Pa.
- Saws, Makers of.**
 Disston, Henry & Sons, Phila., Pa.
 National Saw Co., 96 Reade St., N. Y.
 Simonds Mfg. Co., Fitchburg, Mass.
- Saw Vises.**
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Saw Sets.**
 Taintor Mfg. Co., 84-86 Chambers, N. Y.
- Scales, Manufacturers of.**
 Buffalo Scale Co., Buffalo, N. Y.
 Chatillon, John & Sons, 85-89 Cliff, N. Y.
- Scrapers, Road.**
 Am. Steel Scraper Co., Sydney, Ohio.
 Kilbourne & Jacobs Mfg. Co., Columbus, O.
 Sidney Steel Scraper Co., Sidney, O.
- Screens, Coal and Ore.**
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Screens, Door and Window.**
 White, Van Glahn & Co., 15-17 Chatham Sq., N. Y.
- Screw Cutting Machinery.**
 Wells Bros. & Co., Greenfield, Mass.
 Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**
 Brown, R. H. & Co., New Haven, Conn.
 Mayhew, H. H. Co., Shelburne Falls, Mass.
- Screw Plate and Pipe Cutter.**
 Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Wm. H. Haskell Co., Pawtucket.
 Miles, F. S., 205 Quarry, Philadelphia.
 Reynolds & Co., New Haven, Conn.
 Worcester Machine Screw Co., Worcester, Mass.
- Scroll Saws.**
 Barnes, W. F. & John, Rockford, Ill.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Scythe Stones and Whetstones.**
 Pike Mfg. Co., Pike Sta'n, N. H.
 Cleveland Stone Co., Cleveland, O.
- Shafting, Makers of.**
 Brown, A. & F., 17 Dey St., N. Y.
 Cresson, Geo. V. Co., Philadelphia, Pa.
 Fairmount Mch. Co., Philadelphia, Pa.
 Sellers, Wm. & Co., Inc., Phila., Pa.
 Stow Mfg. Co., Binghamton, N. Y.
- Shaft Support.**
 Decatur Shaft Support Co., Decatur, Ill.
- Shaped Iron and Steel, Manufacturers of.**
 Atna-Standard Iron & Steel Co., Bridgeport, O.
 East Chicago Fdry Co., Chicago, Ill.

Allentown Rolling Mill. Allentown, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Passaic Rolling Mill Co., Paterson, N.J.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
The Phoenix Iron Co., Phila., Pa.
Tudor Iron Works, St. Louis, Mo.

Shears and Scissors.
Acme Shear Co., Bridgeport, Conn.
Heinrichs, R. Sons Co., Newark, N. J.

Sheet Iron and Steel, Manufacturers of.
Etna-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Chess Bros., Pittsburgh, Pa.
Jersey City Galvanizing Co., 112 John St., N. Y.
Mahoning Valley Iron Co., Livingston, Ohio.
Morehead-McCleane Co., Pittsburgh.
Pierson & Co., 29 Broadway, N. Y.
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.

Sheet Zinc.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Show Cases.
Union Show Case Co., Chicago, Ill.

Sinks.
Douglas, W. & B., Middletown, Conn.

Skates, Ice.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

Skates, Roller.
Henley, M. C., Richmond, Ind.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

Slag Machines.
Cambria Iron Co., Johnstown, Pa.

Smelting Works.
Reeves, Paul S., 760 S. Broad, Phila.

Soldering Coppers.
Glendenin Bros., Baltimore, Md.
Covert Mfg. Co., West Troy, N. Y.

Speaking Tubes.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.
Wollensak, J. F., Chicago, Ill.

Spelter.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
Missouri Metal Co., St. Louis, Mo.

Spoons and Forks.
Boardman, L. & Son, New Haddam, Conn.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.

Sporting Goods.
Hartley & Graham, 313-315 B'way, N.Y.

Springs.
Clark & Cowles, Plainville, Ct.
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Roland, Wm. & Harvey, Phila., Pa.
Sabin Machine Co., Montpelier, Vt.
Tuck Mfg. Co., Brockton, Mass.
Washburn & Moen Mfg. Co., Worcester, Mass.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.

Spring Hinges.
Bommer Bros., Brooklyn, N. Y.
Fullman Sash Balance Co., Rochester, N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Hdw. Co., 14 Warren St., N. Y.

Stamped Ware.
Am. Stamping Co., 104 & 106 John St., New York.

Stamping Works.
Avery Stamping Co., Cleveland, O.
Cleveland Stamping & Tool Co., Cleveland, O.

Staples.
Cobb & Drew, Plymouth, Mass.
Titchener, E.H. & Co., Binghamton, N.Y.

Steam Gauges.
Bristol Co., Waterbury, Conn.

Steam Hammers, &c., Makers of.
Dienelt & Eisenhardt, Philadelphia, Pa.
Dudgeon, Richard, 24 Columbia Street, N. Y.
Trethewey Mfg. Co., Pittsburgh, Pa.

Steam Heating & Oil Separators.
Webster, Warren & Co., Camden, N. J.

Steam Separators.
Goubert Mfg. Co., 32 Cortlandt St., N.Y.
Harrison Safety Boiler Wks., Phila., Pa.
Webster, Warren & Co., Camden, N. J.

Steam Specialties.
Lunkenheimer Co., Cincinnati, O.

Steel, Cold Rolled Strip.
Superior Steel Co., Pittsburgh, Pa.
Wilmoth & Hobbs Mfg. Co., Bridgeport, Conn.

Steel Figures and Alphabets.
Krogsrud, W., 61 Fulton St., N. Y.

Steel Importers.
Abbott, Wheelock & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 83 John, N. Y.
Wetherell Bros., 93 Liberty St., N. Y.
Whitney, A. R. & Co., B'way, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

Steel (Mushet's Special).
Jones, B. M. & Co., Boston.

Steel Manufacturers.
Etna-Standard Iron & Steel Co., Bridgeport, O.
Bethlehem Iron Co., S. Bethlehem, Pa.
Baker, Hermann & Co., 103 Duane St.
Carbon Steel Co., Pittsburgh, Pa.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crescent Steel Co., Pittsburgh, Pa.
Frankford Steel Co., Philadelphia.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Kaiser, Ellison & Co., Sheffield, Eng.
La Belle Steel Co., Pittsburgh, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Moorhead-McCleane Co., Pittsburgh, Pa.
Moss, F. W., 83 John, N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Rowland, Wm. & Harvey, Frankford, Philadelphia.
Singer, Nimick & Co., Pittsburgh, Pa.
Superior Steel Co., Pittsburgh, Pa.
Wordlaw, S. & C., Sheffield, Eng.
Wetherell Bros., 93 Liberty, N. Y.
Wilmoth & Hobbs Mfg. Co., Bridgeport, Conn.

Steel, Manufacturers' Agents.
Barns, C. K. & Co., Philadelphia, Pa.
Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 29 B'way, N. Y.
Lindsay, Jas. G. & Co., Phila., Pa.
Pierson & Co., 29 Broadway, N. Y.

Steel Rails, Manufacturers of.
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville, Pa.
Riverside Iron Wks., Wheeling, W. Va.

Steel, Tool.
Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.

Step Ladders, Rolling.
Bicycle Step Ladder Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Croissant, M., Albany, N. Y.
Morley Bros., Saginaw, Mich.

Stocks and Dies.
Armstrong Mfg. Co., Bridgeport, Conn.
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Hart Mfg. Co., Cleveland, O.
Oster Mfg. Co., Cleveland, O.
Saunders' Sons, D., Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Stone Saws and Planers.
Lincoln Iron Works, Rutland, Vt.

Stove Linings.
Ostrander Fire Brick Co., Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Street Lamps.
Rochester Lamp Co., 42 Park Place, New York.
Steam Gauge & Lantern Co., Syracuse, N. Y.

Structural Iron Work.
Lindsay, Jas. G. & Co., Phila., Pa.

Sulphuric Acid.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Tacks, Brads, Staples, &c.
Anthony & Cushman Tack Co., Taunton, Mass.
Atlas Tack Corporation, Boston, Mass.
Glendenin Bros., Baltimore, Md.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.

Taps and Dies.
Butterfield & Co., Derby Line, Vt.
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Testing Laboratories.
Riehle Bros. Testing Mach. Co., Philadelphia.

Testing Machines.
Riehle Bros. Testing Mach. Co., Phila.

Theatrical Hardware.
Wollensak, J. F., Chicago, Ill.

Thill Springs.
Frost Thill Spring Co., Boston, Mass.
Sabin Machine Co., Montpelier, Vt.

Timber and Mineral Lands.
Robertson, E. Co., Cincinnati, O.

Time Record.
Scattergood, H. W., Phila., Pa.

Tin Plate Machinery.
Lloyd Booth Co., Youngstown, Ohio.

Tinning Process.
Sands, Thos., Nashua, N. H.

Tinware.
Am. Stamping Co., 104 & 106 John St.

Tire Upsetters.
Butts & Ordway, Boston, Mass.

Toe Calks, Steel.
Burke, P. F., Boston, Mass.

Tool Blocks.
Hulbut-Rogers Mch. Co., South Sudbury, Mass.

Tool Chests.
Am. Tool Co., 200 W. Houston St., N.Y.

Tool Holders.
Armstrong Bros. Tool Co., Chicago, Ill.

Tools.
Brown, R. H. & Co., New Haven, Conn.
Hogson & Pettis Mfg. Co., New Haven, Conn.
Mayhew, H. H. Co., Shelburne Falls, Mass.
Mills Falls Co., 93 Reade, N. Y.
Richardson, C. W. & Son, Athol, Mass.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers.
Starrett, L. S., Athol, Mass.
Wilkinson, A. J. & Co., Boston, Mass.

Tools, Blacksmith and Wheelwright.
Buffalo Forge Co., Buffalo, N. Y.
Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Plumb, Fayette R., Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Tools, Steam and Gas Fitters'.
Saunders' Sons, D., Yonkers, N. Y.

Torches, Oil and Gasoline.
Dangler Stove & Mfg. Co., Cleveland, O.
Schneider & Trenkamp Co., Cleveland, Ohio.

Transom Lifters.
Wollensak, J. F., Chicago, Ill.

Trucks, Manufacturers of.
Clark, G. P., Windsor Locks, Conn.

Tubes, Seamless Drawn Copper.
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Randolph & Clowes, Waterbury, Conn.

Tubes, Steel.
Leng's, John S. Son & Co., 4 Fletcher St., New York.
U. S. Projectile Co., Brooklyn, N. Y.

Tumbling Barrels.
Henderson Bros., Waterbury, Conn.

Turnbuckles.
Cleveland City Forge & Iron Co., Cleveland, O.
Merrill Bros., Brooklyn, E. D.

Twist Drills, Makers of.
Cleveland Twist Drill Co., Cleveland.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland.

Valves, Gas, Water and Steam.
Chapman Valve Mfg. Co., Boston.
Egton-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., 71 John, N. Y.
Lunkenheimer Co., Cincinnati, O.
McNab & Harlin Mfg. Co., 56 John, N. Y.

Ventilator Appliances.
Howard & Morse, 45 Fulton St., N. Y.

Vise Jaws.
Newark Mch. Tool Co., Newark, N. J.

Vises.
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Mills Falls Co., 93 Reade St., N. Y.
Prentiss Vise Co., 44 Barclay, N. Y.

Wagon Jacks.
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N.Y.

Washers.
Haskell, Wm. H. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
Sternbergh, J. H. & Son, Reading, Pa.

Watches.
Ingersoll, R. H. & Bro., 65 Cortlandt St., N. Y.

Water Coolers.
Shepard, Sidney & Co., Buffalo, N. Y.

Water Meters.
Worthington, Henry R., 86 & 88 Liberty St., N. Y.

Water Wheels.
Poole, Robt. & Son Co., Baltimore, Md.

Wheelbarrows.

Amer. Steel Scraper Co., Sidney, Ohio.
Bryan Mfg. Co., Bryan, Ohio.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Sidney Steel Scraper Co., Sidney, O.

Window Cleaners.

Bourke Mfg. Co., Youngstown, O.

Window Cord, Makers of.

Samson Cordage Works, Boston, Mass.

Wire, Manufacturers of.

Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Prentiss, Geo. W. & Co., Holyoke, Mass.
Salem Wire Nail Co., Salem, O.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester.
Wetherell Bros., 93 Liberty St., N. Y.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Wire Cloth.

Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Sons, Philadelphia.
Estey, W. S., 65 Fulton, N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff.
Howard & Morse, 45 Fulton, N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleveland.

Wire Cutters.

King, J. M. & Co., Watertown, N. Y.

Wire Dies.

McFarland, Wm., Trenton, N. J.
Newton & Shipman, 83 John St., N. Y.

Wire Fences, See Fencing, Iron and Wire.

Wire Goods, Manufacturers of.
Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.
Darby, Edward & Sons, Phila.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
Ludlow-Saylor Wire Co., St. Louis.
Ossawan Mills Co., Norwich, Conn.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Williamson, C. T., Wire Novelty Co., Newark, N. J.
Wire Goods Co., Worcester, Mass.

Wire Machinery.

Am. Tool Wks., Cleveland, O.
Manville, E. J. Mch. Co., Waterbury, Ct.
Morgan Construction Co., Worcester, Mass.
Waterbury Mch. Co., Waterbury, Conn.

Wire Straightening and Cutting Machinery.
Adt, John & Son, New Haven, Conn.

Wire Nails.

Bond Nail Co., Raynham, Mass.
Indiana Wire Fence Co., Crawfordsville, Ind.
Kilmer Mfg. Co., Newburg, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
Phillips, Townsend & Co., Phila., Pa.
Salem Wire Nail Co., Salem, O.
Taunton Wire Nail Co., Taunton, Mass.
Whitney, A. R. & Co., New York City.

Wire Rope, Iron and Steel, Makers.

Broderick & Bascom Rope Co., St. Louis, Mo.
California Wire Works, San Francisco.
Hazard Mfg. Co., Wilkesbarre, Pa.
A. Leschen & Sons Rope Co., St. Louis.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester, Mass.

Wire Rope Machinery.

Kay, J. F., Passaic, N. J.

Wood Turning.
Cleveland Wood Turning Co., Cleveland, O.

Wood-Working Machinery.

Egan Co., Cincinnati, Ohio.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Wilkinson, A. J. & Co., Boston, Mass.
Wrenches, Manufacturers of.
Bemis & Call Hardware & Tool Co., Springfield, Mass.
Billings, Spencer & Co., Hartford, Conn.
Coes Wrench Co., Worcester, Mass.
Trimont Mfg. Co., Roxbury, Pa.
Walworth Mfg. Co., Boston, Mass.
Williams, J. H., Brooklyn, N. Y.

Wringers.
Colby Wringer Co., Montpelier.
Peerless Mfg. Co., Cleveland, Ohio.

Yacht Hardware.

Ferdinand, L. W. & Co., Boston, Mass.

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Anthony & Cushman Tack Co.....	10	C. & C. Electric Co.....	30	Detrick & Harvey Machine Co.....	43	Haskell, Wm. H. Co.....	88
Arcade File Works.....	62	Caldwell Mfg. Co.....	76	Detroit Foundry Equipment Co.....	25	Hazard Mfg. Co.....	6
Arcade Malleable Iron Co.....	20	California Wire Works.....	6	Diamond Clamp & Flask Co.....	66	Heinisch's R. Sons Co.....	65
Armstrong Bros. Tool Co.....	38	Cambria Iron Co.....	17&20	Diamond State Iron Co.....	79	Henderer, A. L.....	36
Armstrong Mfg. Co.....	34	Cambridge Iron & Steel Co.....	13	Dienelt & Eisenhardt.....	36	Henderson Bros.....	21
Artificial Gas Engineering Co.....	24	Cambridge Roofing Co.....	13	Dietz, Schumacher & Co.....	37	Hendey Machine Co.....	54
Athol Machine Co.....	69	Canfield, H. O.....	33	Dille & McGuire Mfg. Co.....	86	Hendricks Bros.....	2
Atlas Tack Corporation.....	10	Capewell Horse Nail Co.....	80	Disston, Henry & Sons.....	31	Hendrick Mfg. Co., Ltd.....	7
Avery Stamping Co.....	67	Carbon Steel Co.....	18	Dixon, Jos., Crucible Co.....	63	Hendryx, A. B. Co.....	3
Ayer, H. C. & Gleason Co.....	38	Carlin's Sons, Thomas.....	48	Dodd, A. W. & Co.....	95	Henley, M. C.....	86
Babcock & Wilcox Co.....	29	Carpenter, J. M. Tap & Die Co.....	95	Dodge Mfg. Co.....	44	Herrick, J. A.....	25
Raeder, Adamson & Co.....	56	Chadborne & Coldwell Mfg. Co.....	88	Donaldson Iron Co.....	21	Hiertz, T. & Son.....	3
Banker & White.....	63	Chambers Bros. Co.....	88	Douglas, W. & B.....	58	Hill, Clarke & Co.....	49
Bardsley, J.....	82	Champion Blower & Forge Co.....	39	Draper Machine Tool Co.....	48	Hobson, F., Seaman & Co.....	16
Barns, C. K. & Co.....	20	Champion Iron Co.....	7	Dudgeon, Richard.....	37	Hoffman, J. W. & Co.....	15
Barnes, W. F. & John.....	35	Chapman Valve Mfg. Co.....	31	Dunbar Bros.....	4	Hogan, John L. & Co.....	15
Barnett, G. & H.....	63	Chatillon, John & Sons.....	71	Dunham Nut Co.....	87	Hoggson & Pettis Mfg. Co.....	29
Barnum, E. T.....	10	Cheney, S. & Son.....	21	Dupont Mfg. Co.....	34	Hollands Mfg. Co.....	59
Bass Foundry & Machine Works.....	26	Chess Bros.....	21	Durant, W. N.....	32	Holmes & Edwards Silver Co.....	66
Bay State Stamping Co.....	45	Chester Steel Casting Co.....	22	Dwight Slate Machine Co.....	35	Hooker-Colville Steam Pump Co.....	49
Bellevue Pump Co.....	59	Chicago Spring Butt Co.....	68	Eagle Bicycle Mfg Co.....	95	Houston, C. B. & Co.....	15
Bement, Miles & Co.....	36	Chrome Steel Works.....	17	East Chicago Foundry Co.....	21	Howard Iron Works.....	63
Bemis & Call Hardware & Tool Co.....	82	Church, Isaac.....	88	Eccles, Richard.....	77	Howard & Morse.....	7
Berger Bros.....	64	Cincinnati Corrugating Co.....	9	Egan Co.....	38	Howson & Howson.....	6
Bethlehem Iron Co.....	20	Clafen Mfg. Co.....	33	Enterprise Mfg. Co. of Pa.....	70	Hudson, C. E. & Co.....	85
Bevin Bros. Mfg. Co.....	69	Clapp, E. D. Mfg. Co.....	77	Erie Engine Works.....	27	Hurlbut-Rogers Mch. Co.....	44
Bickford Drill & Tool Co.....	42	Clapp, Geo. M.....	49	Estey, W. S.....	6	Hutchinson, F. S. Co.....	64
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Signall & Keeler Mfg. Co.....	36	Clarke, Thomas.....	59	Eureka Cast Steel Co.....	96	Independent Electric Co.....	68
Billings & Spencer Co.....	82	Claus Shear Co.....	67	Evans-Friction Cone Co.....	3	Indiana Wire Fence Co.....	7
Bingham, W. Co.....	68	Clement & Dunbar.....	60	Eynon-Evans Mfg. Co.....	30	Ingersoll, R. H. & Bro.....	75
Birmingham Iron Foundry.....	21	Clendenin Bros.....	12	F. & N. Mfg. Co.....	86	Iowa Farming Tool Co.....	83
Bissell, E. Son & Co.....	51	Cleveland Block Co.....	77	Fairmount Machine Co.....	43	Ives, H. B. & Co.....	75
Blair Mfg. Co.....	85	Cleveland City Forge & Iron Co.....	1	Fearing, Wm. S.....	2	Jacobus, W. H.....	88
Blake & Johnson.....	12	Cleveland Fence Co.....	6	Ferdinand, L. W. & Co.....	68	Jarecki Mfg. Co.....	38
Bliss Co., E. W.....	34	Cleveland Stamping & Tool Co.....	73	Fitch, W. & E. T.....	95	Jeffrey Mfg. Co.....	32
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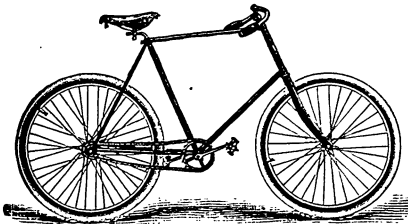
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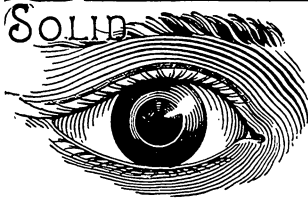
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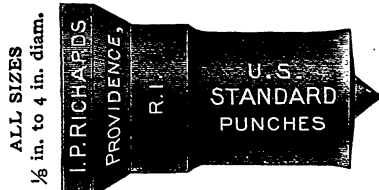


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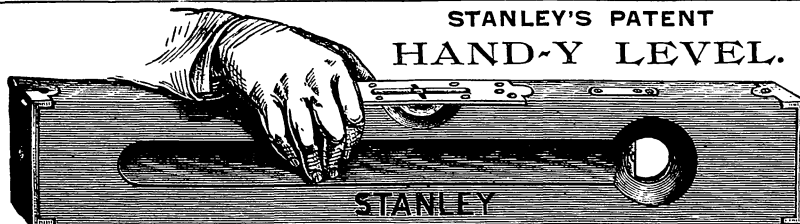
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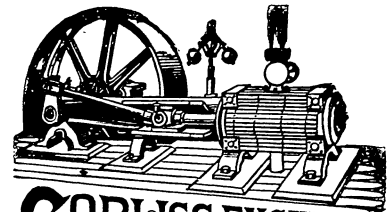
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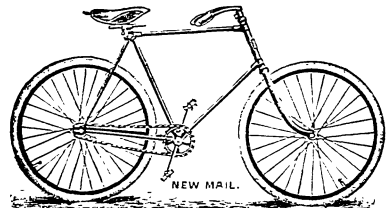
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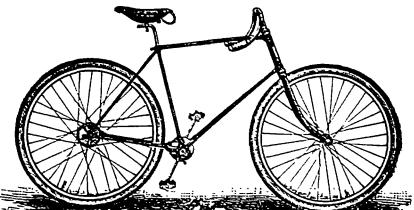
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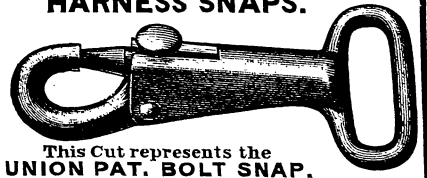
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See Page 56.

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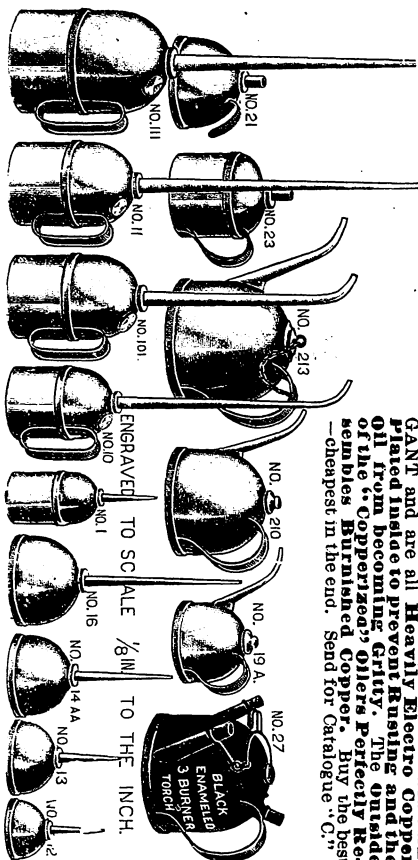
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LAMPS, FILLERS, TALLOW POTS,
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These Oilers are **CHEAP, DURABLE** and **ELU-
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of the "Copperized" Oilers is perfectly Re-
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Columbia Spring Hinges

FOR
**Screen
Doors.**
Cast Iron,
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These Hinges are very simple in construction.
They are packed flat, with the tension of the
Springs adjusted, and are "ready for business"
as soon as attached to the door.
Having no small or loose parts, they cannot
get out of order.
They are reversible and can be used on either
Right or Left Hand Doors.
No. 14, 3 x 2½, Japanned.
1 Dozen pairs in a box. ½ Gross pairs in a case.
THE CHEAPEST AND BEST SPRINGS IN THE
MARKET. SEND FOR PRICES.
MANUFACTURED BY
VAN WAGONER & WILLIAMS HDW. CO.,
Cleveland, Ohio, and 14 Warren Street, New York.

THE IRON AGE

THURSDAY, MAY 31, 1894.

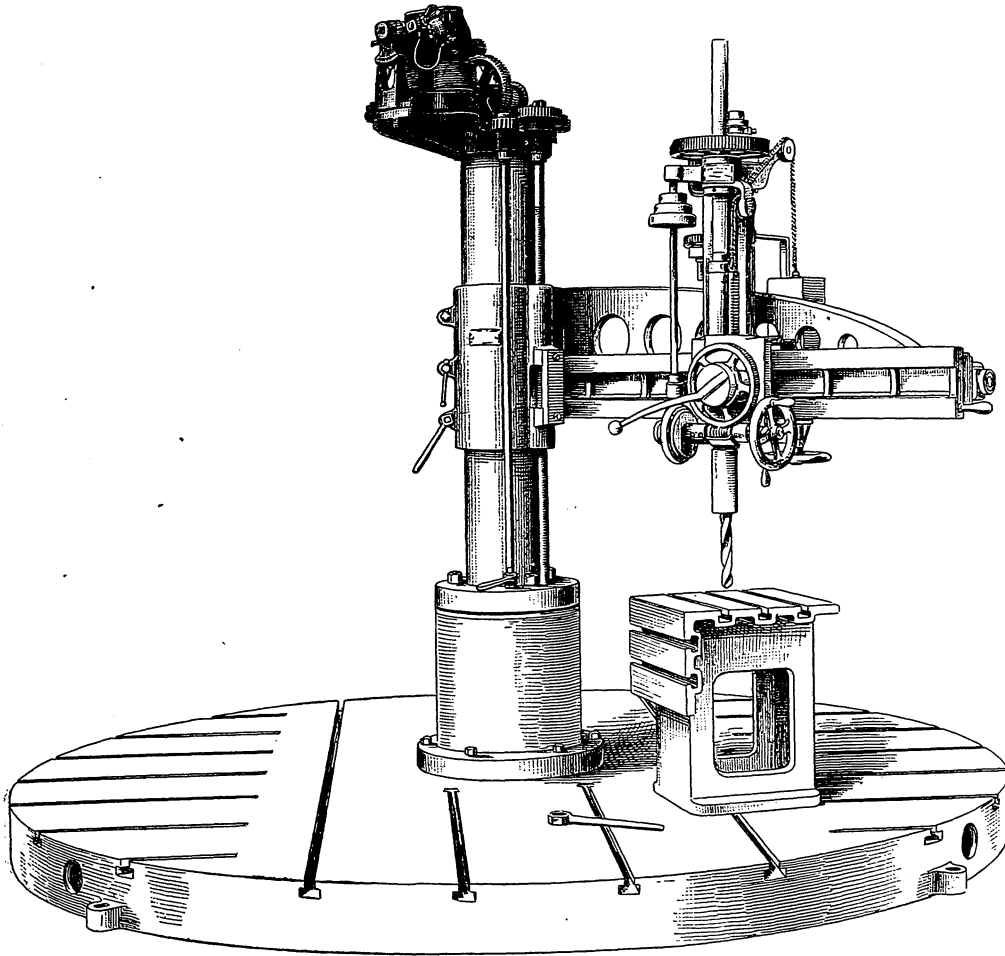
Electrically Driven Radial Drill.

The accompanying engraving represents a radial drill built by the Bickford Drill & Tool Company of Cincinnati, Ohio, and driven by a Crocker-Wheeler electric motor. The motor is fastened to the top cap of the drill column and its armature shaft is fitted on one end with a raw hide pinion, which is engaged with a spur wheel which is at one end of a short shaft. This shaft carries at the other end a steel miter

arrangement of this drill, fitted with an electric motor, has proved to be satisfactory in every respect.

Foreign Corporations in New Jersey.—An act of the Legislature of New Jersey, approved May 15, 1894, relative to corporations of other States doing business in that State, provides that on and after July 1, 1894, no such corporation, other than banking, insurance and railroad companies, shall transact business in New Jersey until they

taxes, fees, penalties, licenses, fines or other obligations or requirements are imposed upon such corporations of this State doing business in such other State or nation, or upon their agents therein, so long as such laws continue in force, the same taxes, fees, penalties, licenses, fines, obligations or requirements of whatever kind, shall be imposed upon all such corporations of such other State or nation doing business within this State and upon their agents here." There is a proviso that no previously



ELECTRICALLY DRIVEN RADIAL DRILL.

wheel, which engages with a similar wheel on the upper end of the vertical shaft in the back of the column. From this shaft the power is transmitted to the horizontal shaft in the back of the arm, and from here to a short vertical shaft in the back of the head, which drives the spindle direct. The gear on this machine is attached directly to the spindle, which arrangement greatly reduces the strain on the shafts. The arm of the drill swings completely around in a full circle, and the base of this machine is also made in a full circle, which gives the advantage in setting the work on one end of the base while the other pieces are being drilled. The remainder of the machine is similar in construction to the regular line of drills built by this company. The entire ar-

shall have filed in the Department of State: 1, An attested copy of their charter or certificate of organization, and 2, a statement of their capital stock authorized, amount issued, character of their business, and designating a citizen or corporation in the State upon whom legal service may be made. In certain cases service may be made upon the Secretary of State. Upon filing these papers the Secretary of State shall issue a certificate authorizing the corporation to transact business in New Jersey. The fees are \$5 for filing each paper and \$5 for certificate of authority—total, \$15; for service of process upon Secretary of State, \$2. In addition to the foregoing a retaliatory feature was enacted, which provides that "when, by the laws of any other State or nation, any other

established requirement shall be affected by this act.

Stahl und Eisen illustrates and describes a method in use at the iron works of Kulebaki, Russia, for making briquettes, or patent fuel, from the refuse of charcoal and producer tar. The plant, which was designed by Adam Onnfrowicz, Murom, in the government district of Wladimir, Russia, has been in operation for some years. The product was 320 tons of patent fuel in 1891, 402 tons in 1892 and 291 tons in 1893.

The French naval estimates for the present fiscal year amount to \$55,400,000, an increase of about \$2,000,000 over the amount provided last year.

Progress in Iron Making in the South.

BY JOHN BIRKINBINE, PHILADELPHIA, PA.

Iron production in Alabama may be considered as in its third state of development since the Civil War, a condition which offers greater promise of real progress than either of the other well marked eras since attention was drawn prominently to the mineral resources of this and adjoining States. Prior thereto, chiefly in *ante bellum* times, a few charcoal blast furnaces were scattered through the South, making a quantity of product which would now be deemed insignificant.

The first stage of pronounced development extended through some years subsequent to the war, when other charcoal blast furnaces were erected to smelt the brown hematites of north-eastern Alabama, and when the extent and juxtaposition of the Red Mountain ores and coking coal fields attracted attention to the vicinity of Elyton as an iron producing district, a settlement which has since grown to the important commercial center of Birmingham. This stage marked the initial appreciation which attracted liberal investments of money from foreign countries and from the wealthier States, or those in which the value of an iron industry was recognized. However, at that time faith in the future of Alabama as a large producer of iron was by no means generally accepted, although the development of her resources was steady and healthy. In this development Georgia and Tennessee participated, some blast furnaces of large size being erected in those States to smelt ores with coke and supplement the product of the smaller charcoal furnaces which had made up their quota.

The second stage was one of abnormal development, accompanied in many instances by wild speculation. The growth of Chattanooga, the success of Birmingham, and the profits reported to have been reaped by the original investors suggested numerous attempts to establish rival iron producing centers, accompanied by promises of profits on the sales of land equaling or even exceeding the fabulous gains understood to have been made by the stockholders of the Elyton Land Company and others. The blast furnace was chosen as the initial feature necessary to secure the founding of a future metropolis, and millions of money were spent in erecting furnace plants or buildings for industries and in laying out adjacent lands into town lots which were sold to enthusiasts at handsome advances. The epidemic of boom cities based upon the development of the iron industry spread from Maryland through the Virginias, Kentucky, Tennessee, Alabama and Georgia, and broke out locally in North Carolina, Texas and elsewhere until a sufficient number of cities were located and laid out on such a scale that it would demand a concentration of more than half of the present population of the United States into the section referred to, in order to populate these cities and the adjacent territory in a way necessary for their maintenance. Had all of the blast furnace projects been carried out there would have been a producing capacity approximating the current demands of the entire nation within the above mentioned territory.

The boom times are over. Empty storehouses, unoccupied industrial build-

ings, idle or incomplete blast furnace plants and dwellings which are without tenants in these air cities represent an amount of capital wasted which would have been sufficient, if properly applied, to have greatly advanced the material wealth of the country. The collapse has wrought widespread injury, and investments in iron manufacture have been discredited at home and abroad, because a good industry was used to bolster up real estate and other speculations which ordinary caution or investigation would have condemned.

The State of Alabama has to-day a total of over 50 blast furnaces of an estimated aggregate producing capacity of over 1,300,000 long tons per annum. In other words, if all of these plants could obtain supplies of raw materials and could all be operated simultaneously their reported capacities would represent 14 per cent. of the greatest output obtained in the United States in 1890, when 9,202,703 long tons were produced. If but three-fourths of the estimated outputs were made in any one year, this would represent 11 per cent. of the maximum reported production of all the blast furnaces in the United States. In 1890 the population of Alabama, 1,513,017, represented 2½ per cent. of the inhabitants of the United States.

The group of States embracing the Virginias, Kentucky, Tennessee, Alabama and Georgia have a total of 130 blast furnaces, whose combined capacity is estimated at 3,200,000 long tons, equal to 35 per cent. of the nation's total for 1890, or allowing for a contemporaneous activity of three-fourths of the plants, 26 per cent. of the same total. The census for 1890 gives the number of inhabitants of these States as nearly 9,400,000, equivalent to 15 per cent. of the population of the country, and this population, by reason of the large proportion of negroes, is below the average as consumers of products of the iron industry.

It is evident from the above that the plants which are by common usage designated as "Southern furnaces" have a productive capacity greatly in excess of the demands of what may be considered their legitimate market, and that in the present season of depression this disproportion is very marked. As a result, the only active plants are those which are specially favored by abundant supplies of cheap raw materials, by superior location, by excellent management, by low freights to distant points, by ample capital or good credit, or by a demand for their particular product—conditions which affect the iron industry similarly in other sections of the country. Had the development of the South followed the natural law of supply and demand, it is possible that to-day the ability to produce pig iron at low cost would have made its blast furnaces show to better average advantage than others located elsewhere. But the excess of producing capacity, while relegating to inactivity a large proportion of the iron works, has in the struggle for "the survival of the fittest" done a permanent good, and brought about a third stage of development which suggests practical, permanent advancement.

A late visit to Alabama and Tennessee iron works emphasized the results of this keen competition, and offered a solution of the reason why the South can produce pig iron at costs hitherto unknown in this country, and unusual even in foreign lands, which have a lower wage basis. Comparing the blast furnace practice now followed with that prev-

alent five years ago, six prominent factors must impress the observer as aiding materially to reduce the cost of producing pig iron. These are:

1. A better utilization of labor.
2. A reduction in the cost of coke and an improvement in its quality.
3. Greater care in preparing the ore used and improvements in handling it.
4. Advanced blast furnace practice.
5. A decided increase in the number of farms and gardens which are tilled to produce the necessities of life upon which an increasing population must depend.

6. A readjustment of real estate values from figures which discounted the future to an extent bordering upon dementia to those which more nearly represent their commercial importance.

The freight rates at which pig iron is carried long distances are an important feature in favor of the Southern blast furnaces, aiding the iron made at low costs to reach markets which are far removed and otherwise inaccessible. While these advantageous traffic charges expand the market and thereby augment the demand for the product of the furnaces, they are not considered among the factors of local advancement, but rather an encouragement for the development which causes enumerated above have brought about.

An attempt will be made to discuss briefly each of the factors, but they are so intimately associated that in several cases the advantage apparently resulting from one improvement would have been impossible except in combination with others; therefore the third stage of development may, at least for the States of Alabama and Tennessee, be considered as the result of a combination of all the above mentioned factors.

Labor.

Data which were supplied in 1892 for an address which, as president of the American Institute of Mining Engineers, I made upon "The influence of location upon the pig iron industry," showed that at the plants embraced in the group recognized as "Southern furnaces," the cost of labor per ton of iron was greater than in other prominent iron producing districts, although the wage rate was as low or lower than in those with which the Southern furnaces were compared. This was due in part to the necessity of using more raw materials to produce a ton of pig iron, and in part to the intelligence and application of labor. By the improvements in ore and coke supplies, to which reference will be made, the quantities of materials fed to the furnaces and consequently the amount of cinder produced are materially reduced; but in addition, the apparently excessive number of employees which was a matter of comment to visitors has disappeared, and the work done by the navvies about the blast furnaces compares favorably with that performed elsewhere. A bottom filler who for 9 cents per hour is kept busy filling charging bars with ore and dragging over a wooden floor a buggy which when loaded weighs almost a ton, cannot be classed among those who fail to earn their bread by the sweat of their faces. The negro, whose domination is feared more in theory to advance political aims than in reality, is the strong arm upon which the Southern iron industry must lean for its continued activity. The low labor cost which at one plant where two furnaces were in blast approximated 80 cents per ton of iron made would not have been reached without the labor of the negro. This cost is claimed to in-

clude all labor and salaries about the plant and current repairs, but does not include the general office or laboratory salaries or labor for reconstruction and improvements. The manager of this plant stated that in 1888 the labor per ton of pig iron was \$1.93, so that at the same furnaces in 1894 the labor charge was 40 per cent. of what it was six years ago.

Practice has improved the intelligence and skill of the labor employed, and the demand which numerous blast furnaces made upon the community has educated a large number to do the work required, giving to the managers of active plants the pick of the most desirable.

Prevailing rates for ordinary labor are 80 and 90 cents per day, the heavier work of fillers commanding \$1 and \$1.10 for a full turn of 12 hours. If allowance be made for profits resulting from the commissaries maintained by most of the Southern iron companies, the net cost of labor may be considered as from 15 to 20 per cent. below the figures given.

Fuel.

The use of washed coke is to be credited with a goodly share of the improved results which are noticed in the operation of blast furnaces in Alabama and Georgia. This can best be illustrated by a comparison of the operations of two neighboring plants, using mixtures of ores of practically equal percentages of iron. One plant, which charged coke made from the slack and disintegrated coal which had been washed, was producing more iron per cubic foot of furnace capacity and was also using 12 per cent. less fuel per ton of iron than the other plant, which employed coke made from the same coal without washing. The expense of washing adds but little to the cost of the coke, and this slight advance may be offset by the utilization of material which would in some cases be carried to the dump, but a process which reduces the ash from 19 to 12 per cent. and eliminates about one-half of the sulphur from the coal would be economical from the standpoint of a blast furnace manager, even if it added considerably to the cost of the coke supplied. The reduction in the amount of ash and sulphur permits of a decrease in the flux used, and the space which would be occupied by these unproductive materials in the blast furnace shaft can be filled by others which, by augmenting the furnace output, reduce the charges per ton for labor, depreciation, interest and fixed charges, while the diminution of the amount of cinder forms a factor worthy of notice when prices are low.

The consumption of coke per ton of iron made at 12 Alabama and Tennessee blast furnaces in operation varies from 2450 to 3100 pounds, depending largely upon the ores used and the character of coke supplied. Claims have been made for a smaller fuel consumption and such can probably be shown to have been indicated by charging scale weight for a short time, but no records were presented to the writer when taking into account all of the coke which was charged to the furnace in which less than 2450 pounds could be considered as equitable. To those familiar with the results formerly obtained the above will be considered as a great advance, upon which the blast furnace managers are to be congratulated. The improvement in one plant is shown by the statement that the average consumption of coke per ton of iron there was for the year 1886, 1.64 tons; for the year 1893, 1.57 tons, and for the first three

months of 1894, 1.32 tons, the average daily product per furnace increasing from 119 tons in 1886 to 198 tons in the first three months of 1894. At these 12 blast furnaces referred to the quantity of ore and flux carried by one pound of coke varied from 2.02 to 2.53 pounds.

The prevailing widespread strike of coal miners may or may not change the figures which make up the cost of producing coke, but basing estimates upon the then existing miners' contracts (varying from 35 to 45 cents per ton) and adding charges for entry, room trimming, tracks, air, water, timber, hauling, tipples, superintendence, &c., the net cost of a ton of coal without allowance for royalty may be fairly taken as from 70 to 80 cents. From 1.65 to 1.8 tons of coal are necessary to produce a ton of coke, depending upon the loss in washing, handling, the ovens used, &c., an average approximating 1.7 tons being equitable.

An allowance of from 30 to 40 cents will cover the cost of producing 1 net ton of coke from the coal, and the total cost of coke will be made up as follows: 1.7 tons coal costing from \$1.19 to \$1.36 without royalty. If washers are used add, say, 5 cents to these figures. In some cases there is a freight charge from mine to ovens, in others this charge is only on coke from ovens to furnace; in others there is a charge for coal from mine to ovens and another on coke from ovens to the furnace; still others have the washer and tipple close to the ovens and charge directly from the ovens to the furnace. There are individual instances of the latter class where the net cost of coke delivered ready to be loaded into charging buggies does not exceed \$1.50, but to this an allowance for royalties on coal taken from the earth should be made. However, at most of the furnaces the net cost of a ton of coke is between \$1.75 and \$2.10, for freights add 15 to 40 cents per ton, and if royalties are added the average cost will approximate \$2 per ton at the furnace.

Ores.

Judicious selection and care in sorting ores add materially to the results now obtained, and the methods of mining and handling these permit of considerably reducing their cost. The blast furnaces in the neighborhood of Birmingham depend chiefly on the Red Mountain ores, using brown hematite in greater or less proportion as mixtures. Some blue billy (residuum from a sulphuric acid plant at Atlanta) and mill cinder is also used.

The Red Mountain ores vary considerably in the lime and silica contents, and although but two general grades are recognized—viz., the "soft" and "hard"—the calcareous feature of the ores affects their value as to the flux required for them, or the amount which they carry to help out other siliceous ores. The fluxing of the ore charge at various blast furnaces in the Birmingham district was found to require from as low as 5 per cent. at one plant to as high as 50 per cent. of limestone at another, dependent upon the relative proportions of the calcareous and siliceous ores. In Tennessee the approximate equivalents of Red Mountain ores are the soft river ores and the hard mountain ores, and at three plant's the lime percentages used were 15, 18 and 24 per cent. respectively of the ore burden.

It is claimed that in the Birmingham district the Red Mountain ores are now mined, so that the "soft" ores taken

out from open workings until the cover reaches 25 or 30 feet can be loaded on cars for less than 40 cents per ton, and that the hard and soft ores mined under cover can be obtained by contract at 60 cents per ton. In some of the smaller veins in Tennessee the hard red ore is mined for 85 cents per ton. Formerly the Red Mountain ores commanded a royalty of 25 cents per ton. In Tennessee some ore is now mined under royalty at 15 cents, and if this last charge is added to the figures above the net cost at the mines would be for soft Alabama ores, 65 cents; hard Alabama ores, 85 cents; hard Tennessee ores, \$1 per ton. Brown hematite ores command at the mines about the same as the hard red ores of Alabama, but to reach points of consumption heavier freight rates must be added.

A gentleman who has been actively associated with the development of the Birmingham district states that at Redding 84,000 tons of soft Red Mountain ore were obtained from 1 acre by open cut mining. This represents a yield of 1.9 tons per square foot of surface excavated. The vein there showed a thickness of 22 feet, but the highly siliceous character of the lower 4 feet necessitated discarding it; therefore the ore in place may be considered as producing 1 long ton for every 9.5 cubic feet. On this basis, allowing an average thickness of available ore in open cut and underground workings of 12 feet, and deducting for loss in pillars in the underground work, an estimate of 1 long ton for each square foot of the territory mined will represent the available supply of this ore. That is, from a vein area 12 feet in thickness, a mining operation 1000 feet long, carried to a depth of 100 feet on the dip, partly in the open and partly underground, should supply 100,000 tons of ore—an amount sufficient to produce about 40,000 tons of iron.

Another gentleman whose familiarity with the mining operations gives authority to his statement, claims that operations carried on 500 feet on the dip show that the changes in lime, iron and silica vary but slightly from those found at a depth of 300 feet; and he believes that the more extended operations will show less variation in the constituents of the ores than was prominent in the work nearer the surface.

The freight on some local red hematite ores in Alabama and Tennessee does not exceed 10 cents per ton, but for the plants within a few miles of the ore deposits an average charge of 13 cents per ton may be taken. The brown hematites being generally further off from the furnaces the freights on these average higher figures, and the larger percentage of iron permits of this advance.

An interesting experiment is now in progress in the Birmingham district which has for its object the production of an ore low in silica, in the hopes of thus securing pig iron with which to supply basic steel plants. It is proposed to take the inferior ores, mainly the lower stratum of the "soft" ores, which may be considered as containing as much silica as iron, and treating these in a modification of the Davis-Colby roaster. In this roaster the ore is raised to a high temperature, and it is proposed in its descent to have it meet reducing gases and thus convert the sesquioxide into a magnetic oxide. The ore from the roaster will then be crushed and passed through magnetic separators, so as to remove the siliceous material. As the phosphorus in these ores does not occur as apatite it is not

expected that this element will be reduced, but that its relation to the total elements in an ore which is thus raised from, say, 40 per cent. to 55 per cent. of iron will be greater proportionately than in the ore as mined. It is, however, anticipated that the product will be low in silica. Evidently the commercial value of this experiment will depend upon the practicability of a thorough conversion of the sesquioxide into magnetic oxide, for only such portions of the ore as are so converted will respond to the influence of the magnets; and if this portion does not approximate the total iron contents the loss in tailings will be excessive. It will further depend upon the expense of transporting this lean material to the roasters, the power required for and the wear and tear of the crushers, rolls, screens, elevators, &c., and the degree of fineness to which the material must be reduced will influence its acceptability for the blast furnace. The fact that such an experiment is being inaugurated on a commercial scale illustrates that improvement in the quality of material fed to the furnace is appreciated by the managers, and that the advisability of producing a metal which can be manufactured into other forms at home or which will find a market for purposes such as the bulk of the metal now made is not suited for is recognized by the proprietors of blast furnaces.

Practice.

What has been said concerning the improvement in supplies of raw materials and the utilization of labor will naturally indicate that the blast furnace practice has been advanced, and such is truly the case. In the race for the advantage of priority in bringing industries into activity, so as to dispose of the real estate in projected cities, furnaces were built within the shortest time limits, and some of the structures will not be enduring monuments to their designers or constructors. Others, when completed, were fired before arrangements had been made for working capital or for maintaining supplies of suitable materials from which to produce the metal. The demand for managers for a number of new plants was such that some superintendents had their initial experience in directing a blast furnace handicapped by imperfect construction, insufficiency of equipment, variable or uncertain fuel supplies and lack of capital. Such a combination was not calculated to elevate the standard of practice, and the changed conditions which have caused an improvement in this particular appear with greater prominence by reason of the contrast with the methods prevailing a few years ago.

A manager, however competent and able, can accomplish little if the company he represents are deficient in working capital or if the materials supplied to him are of inferior character or constantly vary in quality, and on the other hand an abundance of material and labor which commands low rates, and a realization that a cheap product can certainly be made, may result in encouraging supervision which fails to recognize the importance of minor details. Today the Southern furnaces, like others elsewhere, must do their best, and nothing has contributed more to the progress noticeable than the practice which has augmented the output of a given blast furnace and materially decreased the consumption of fuel and the labor demanded per ton of product.

Values.

During the times of engrossing interest in real estate purchases, when

every blast furnace was to be the nucleus about which a large town or an important city was to grow, prices were paid for properties which were fully as great as would be commanded at the same time in the business centers of long established communities, and leases or rentals of buildings were made at such rates as would necessitate either enormous profits on a moderate business or the maintenance of a trade greatly out of proportion to the number of inhabitants who would naturally be attracted to patronize individual establishments. The number of new towns and cities prospected is so great and the story of the collapse has so often been repeated that mention may be made of but a few individual cases where the wildness of the speculative fever and the present condition of affairs make the illustration.

Over \$1,000,000 was represented in the sale of town lots in four days at one of these prospective cities having a railroad station, a few graded streets, the foundations of a hotel and of a blast furnace and some ore and coal land as an encouragement for investors. Probably \$100,000 in the way of dwellings and other buildings was expended; but the entire town site with buildings can now be purchased for less than the latter figure. As in other cases, this boom city collapsed when only partial payments had been made upon the property, but fully \$500,000 was wasted in this single locality. Others could be mentioned where the absolute loss was much greater. Another case may be referred to where a farm of 500 acres sold for \$100,000, of which one-half was paid in cash, and after foreclosure on account of a default of the balance the property was disposed of for \$3850. A tract of land two miles from the center of one of the important Southern iron producing cities was sold for \$500,000, one half of which was paid in cash. The original owners are now foreclosing by reason of default in the payment of the balance, the purchasers considering it to their advantage to sacrifice the money paid rather than to increase their investment.

Naturally the demand for mechanics to build up simultaneously the numerous towns and cities added to the cost of the buildings required for homes, mercantile establishments, blast furnaces and other industries, and the construction account for some of the well built furnaces was so augmented as to demand an unnecessary interest charge on the product. As money was borrowed in many cases to complete or operate the blast furnaces, this indebtedness has been a prominent factor in influencing the cost of pig iron made. The readjustment of values now in progress will be to the decided advantage of the Southern iron industry, and the reorganization or change in ownership of some of the blast furnace plants will put them in the position of being able to reduce fixed charges for interest, &c., to amounts which will relieve them of disadvantage. The extent to which extraneous capital entered into the town site booms is a matter of congratulation to many Southern men, and it is a source of surprise that many men whose business acumen at home caused them to be considered oracles were so ready to follow the *ignis fatuus* of distant boom cities to be built upon a blast furnace as a starter.

Agricultural Development.

The increase in the iron industry of Alabama, while materially augmenting its population and adding important towns and cities, discouraged the tillage

of land, and probably a greater acreage was under cultivation prior to the prominent development of the iron industry than at any time subsequent thereto. The interest in the mineral resources of the State predominated, and the possibilities of establishing industries and manufacturing centers distracted attention from the fertile soil and the advantageous climate which place Alabama among the most favored States of the Union. As a consequence meat, hay and many other necessities for the sustenance of man and beast have been brought in large quantities from other States or from distant parts of the commonwealth to supply the growing industrial districts of Alabama, Tennessee and Georgia. It is gratifying, however, to note an apparent increase in the amount of farm land and a decided augmentation of the number of small truck gardens and farms in the vicinity of the industrial centers, for this section of the country will only reach the position to which its natural advantages entitle it when food is abundant and cheap, for then labor can be maintained at rates which will give the districts the advantages which nature's lavishness has offered over others less favored.

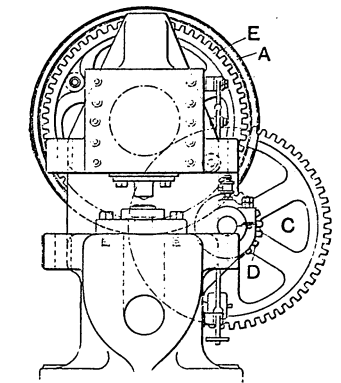
The demands of the lumber industry and the amount of wood cut to supply charcoal for the blast furnaces depending upon this fuel have materially increased the area of arable land, and a proper utilization of this will go far to advance the growth and maintain the permanence of the Southern iron industry.

Cheap labor is only economical when the laborer can live comfortably and be well fed on a low wage basis, the communities which can house and feed their workmen well at low cost having advantages over others where rents and provisions are more expensive.

Upon returning from the visit which gave opportunity to collect the data for the above conclusions, a gentleman interested in a Pennsylvania blast furnace remarked that in five years the Southern iron industry would be practically extinct, but I venture the prophecy that he, although still a young man, will never see the day when a result so much to be regretted will occur. The Southern blast furnaces are on the true road to success, and all American citizens should rejoice in the development of this or any other industry. True, some of the furnaces built for town ornaments may never be lighted, the inefficient equipment of others may have to be united to secure satisfactory plants, and some whose inactivity results from want of working capital or deficiency in supplies of suitable materials will probably add their quota of pig iron to the nation's product. Values will be readjusted, some corporations burdened with interest bearing indebtedness will be reorganized, but every indication favors a growth in efficiency of the Southern iron industry.

Such prognostications as given above are as unpatriotic and unbusinesslike as the announcement which has been so often made, and which is still repeated, that each Southern blast furnace put into blast removes a Northern furnace from the active list. This has not been nor will it be the result. The country will continue to be a liberal consumer of pig iron, and nothing but the adoption of a governmental policy which will cripple the iron industry will retard a growth of this specialty in the South commensurate with its augmenting population. The cost at which pig metal can be produced at many of the

Southern blast furnaces, particularly at those which control a liberal ore and fuel supply, will permit of its continuing to invade markets which are naturally claimed for other districts. But the same influences have demanded the most rigid economies in all parts of the country, and the decrease in the cost of iron produced is as marked elsewhere as in the South, so that, notwithstanding the abnormal figures at which iron is now made and the low freight rates prevailing, competition will continue active and attention to all minor details will continue to be demanded.



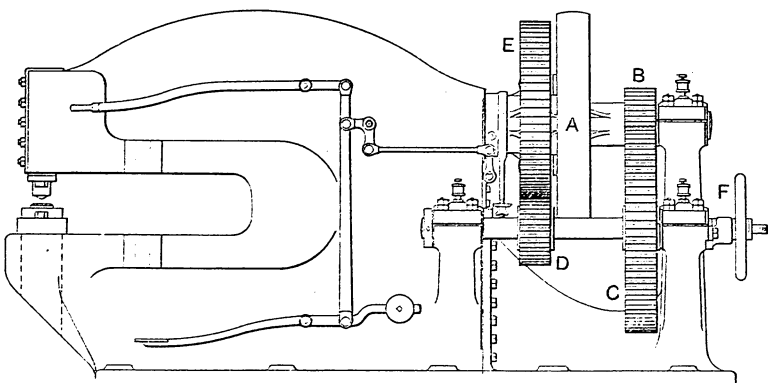
Punching Machine with 50-Inch Gap.

This machine will punch a 4-inch hole through 1-inch steel in the center of circle of a radius of 50 inches. The principal feature of the machine, which is extremely simple in construction, consists in the two methods of driving provided. The machine is driven by the band fly wheel A, the shaft of which extends through the housing and operates the punch. For light work requiring small power and quick strokes of the punch this method of driv-

seems absurd. The quantity of second hand pipe offered is not large, will probably soon be disposed of and is not worth getting excited over. If threats are being made that the buyers of this pipe shall suffer in the future, such threats are in very bad taste and should be withdrawn with apologies.

The Giant Safety Collars.

These collars, which are shown in both the solid and split forms in the



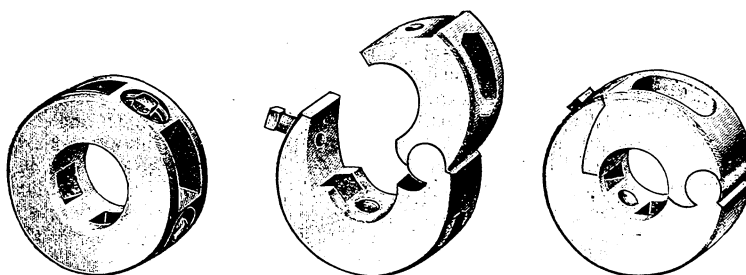
PUNCHING MACHINE WITH 50-INCH GAP.

So much of the Southern pig iron is suitable for the same general class of manufactures that the local competition promises to be most keen, and until the number and extent of the industries erected to convert this into other merchantable products are greatly augmented, the bulk of the output of the Southern blast furnaces must seek consumption at distant points, there competing with pig irons produced nearer the manufactories and of grades covering a variation not obtained from most of the Southern ores. If specially low freights are accorded to any section, and if these rates are maintained, self protection will secure similar consideration for other furnaces from railroads to which these are tributary, and the ultimate result must be that each blast furnace in the United States will have its claims for permanency based upon the cost at which it can continue to produce pig iron and the distance which must be covered to compete with metal made elsewhere. Appreciating this, the present anxiety of those interested in its future industrial development is to secure for the South the establishment of diversified industries, and they are hoping to enter the list as producers of steel by the basic process.

ing is employed. The slow motion of the punch is used when the full capacity of the machine is required. Power is in this case transmitted from the driving shaft through the pinion B, gear C, pinion D and gear E, which then operates the punch. This machine weighs 35 tons and was built by the Cockburn Barrow & Machine Company of Jersey City, N. J., for W. B. Pollock & Co. of Youngstown, Ohio.

Cast iron pipe manufacturers are reported to be incensed because James

accompanying engravings, are chambered so as to avoid unnecessary weight upon the shaft, but this is done in such a way as to preserve full bearing surfaces at each end. The split collars have a hinge joint and may be put upon the shaft in a space equal to their length. When in place, the set screw that holds the collar together also secures it in position on the shaft. No bolts are used, and the set screw heads do not project above the surface. These collars, which are made by the Gouverneur Machine Company of Gouverneur,



Solid.

Split, Open.

Split, Closed.

THE GIANT SAFETY COLLARS

The Italian Government has issued a circular warning its citizens against emigrating to the United States. It specially indicates the States of Pennsylvania, Maryland and Delaware as places where employment is difficult to procure.

Baltimore advices convey the report that a powerful association has been organized by leading capitalists, bankers and railroad officers in the South under the name of the Southern Immigration, Land & Title Company, the object of which is to develop and colonize Southern lands and generally to encourage and direct immigration and trade in the Southern States.

B. Clow & Son of Chicago are endeavoring to sell to municipalities the pipe taken from the World's Fair grounds at Chicago. This pipe was in use but a short time, hardly a year, and has been offered laid down at Cleveland at \$16.50 per ton for 6 and 8 inches and \$14.75 for larger sizes. In competing for a Cleveland contract these prices were bid against \$17.95 to \$18.50 by the Lake Shore Foundry Company and \$18.10 for all sizes by the Anniston Pipe & Foundry Company. It is reported that threats are made of higher prices being charged such cities in the future as are now purchasing the Clow pipe. This

N. Y., have all the strength required, and all useless weight is avoided.

Suit for \$1,000,000 damages was begun by the French Republic last week in the United States Circuit Court at Chicago against the World's Columbian Exposition. The proceedings grew out of the French Government's claim for damages to exhibits of French subjects injured during the fire in the Manufactures Building.

Continued dullness is reported as the prevailing feature in the dry goods trade throughout the country.

The Joy Fluid Pressure Reversing Gear.

From a paper read by David Joy before the Institution of Naval Architects, we take the following description of a fluid pressure reversing gear. The paper begins as follows:

When I last had the honor of reading a paper on the simplification of valve gears before this institution, I concluded by saying, "and I am continuing my investigations in the same direction with a very tangible hope that I shall be able very shortly to take a step further in the simplification of valve gears by about 30 per cent." That was in 1886, or eight years ago, and the paper which your council have done me the honor to accept for my reading to-night is the result of the eight years of work in that direction since that date, and I hope it will not be without interest to you.

When I made the statement quoted I had in my view the treatment of the valve gear of marine engines, which were then increasing in size and speed of revolution with such rapid strides, on a plan on which I had long ago designed and constructed reciprocating steam and water power machinery with satisfactory success, by abandoning all direct mechanical connection between the piston and the valve, and actuating the valve directly by the motive fluid driving the engine, so arriving at about the ultimate limit of simplicity possible in this direction. Many steam hammer were made on this plan and gave very satisfactory results, being extremely sensitive and perfectly controllable for the most delicate blows, even to picking a wafer off a watch glass without breaking the glass. Thousands of steam pumps have also been made on the same plan, the valve being driven either by steam or water with no mechanical connection.

The great simplicity of the plan recommended it strongly for application to marine engines, and if successful promised a large field. But after some years' work in that direction I laid the plan aside, for the time only, I hope; not because of any mechanical difficulties in it that could not be overcome, but that the commercial element was not promising. It was, in fact, an advance, I think too far in advance to find favor, a departure from ordinary practice too wide to be acceptable to either owner or builders. So taking a medium course, and instead of driving the valve itself by fluid pressure, where the fluid would always be in active motion, I proposed to myself to take only the half way step at once, and to adjust and retain in position the machinery for moving the valve by the motive fluid, which would so mostly be in the condition of a static force only.

In carrying out this idea I returned, of course, to the absolute contact plan, driving the valve by a rod direct from the crank axle, but only one rod and one eccentric.

And now I shall not trouble you with the process by which I arrived at the result, but at once describe to you the machinery.

The principle of construction is simply that in place of employing two eccentrics, set each at the proper positions for giving forward and backward motion, and all intermediate points of cut off necessitating the employment of the motion link and all the machinery required to move and hold it in position, I employ but one eccentric set upon the crank shaft, and arranged to be slid across it between the two

points, for forward or backward motion, and one rod direct up to the valve spindle. The method by which this sliding action is accomplished will be described immediately. By this arrangement all the requirements of the link gear are fulfilled, but with one-fifth of the number of parts, and giving a much more correct distribution of steam.

Referring now to Figs. 3 and 4, A is a cast iron or steel square block, fitted on the shaft S in the position usually occupied by the two eccentrics in link gear. This block has cast with it, on opposite sides, two small rams, B B', the other two sides of the block being planed at the surfaces *aa* to receive the eccentric E, which is bolted together centrally in the usual way, having the surfaces *ee* planed to slide on the surfaces *aa* of the square block A. In the eccentric, and forming a part of it, are cast two small cylinders, C C', into which the two rams B B' fit.

We have now the eccentric mounted on a square on the shaft, and free, while moving round with and driven by it, to be slid from side to side on that square; the direction of that sliding action being on the center line, arranged to be at right angles across the center line of the crank and connecting rods, when at extreme ends of the stroke, and within the center line of the crank shaft, toward the crank pins, if inside steam lap is to be used, as is usual with piston valves, or outside of that point if outside lap is required, the movement given to the valve being equally correct either way, and whether for forward or for backward going, each extreme position being for forward or backward going, the central position being mid gear, and any intermediate position giving any variety of cut off. The movement of the eccentric in either direction, and its control in any position, is effected by forcing in a non-elastic fluid at a pressure at either end of the crank shaft, which in this case, as for warships, is already hollow, as at S' (or in ordinary shafts it is drilled).

The fluid is put in motion in either direction by a steam cylinder, M, Fig. 1, operating on the piston of a cylinder, N, which serves as a reservoir for the fluid, transmitting the power through the pipes P P' for forward going, and on through the crank shaft, and so into the small cylinder in the nearest eccentric, suitable for carrying it over in the direction for forward gear, while the fluid in the opposite cylinder in that eccentric is passed on to the next following eccentric to move it over; and so on till the receding fluid finds its way by the pipes P P' to the opposite end of the fluid cylinder N; of course, the reverse action of the steam cylinder again returns the eccentrics to the original position.

Thus the positions of the eccentrics for forward or backward motion are secured without the intervention of any mechanical combination in the form of links, levers, screws, &c., liable to wear out or break down. And by the simple arrestation of the movement of the fluid, the eccentrics are maintained in any position, so giving any required point of cut off. The cylinder N is made of a sufficient capacity to contain a margin of about 25 per cent. more fluid than is required to fill all the eccentrics, pipes and other channels, &c., to be able to follow up the eccentrics if required.

From this description the general principles of the system will be easily understood; and to those familiar with the designing of fluid pressure ma-

chinery it is well known how, working through the medium of a non-elastic fluid for the transmission of power, such machinery is peculiarly sensitive to exact and certain control.

Thus the gear lends itself specially to all the adjustments required in a triple expansion engine at sea; and, though it would have made the paper far too long to go into any of the details for effecting these adjustments, it would not be complete without merely naming some of these. Thus, that while the engine is running, all the three cylinders may be linked up simultaneously, or each may be independently adjusted; and that while so variously adjusted, all may at once be thrown over into full gear, either forward or backward, without any manipulation of screws, as in the reversing levers of link gear.

All these adjustments are effected by differentiating the amount of fluid between the two cylinders in any eccentric; and as in the Maxim gun the recoil of the shot is made available to discharge the exploded cartridge, supply a new one, and fire it, so the tendency of each eccentric, when working expansively, to slip over into full gear is employed, by acting on a small valve in the eccentric by the motion of the engine, so allowing the fluid to change sides, under pressure of the tendency, to the amount for setting the point of cut off required, when it may be locked in that position also by the fluid pressure.

There is also provision made in the arrangements of the valves and pumping gear of the fluid cylinder or reservoir for reversing by hand when the steam is not on, or for refilling any of the pipes, channels or eccentric cylinders, and finally, this part of the gear may be linked up as a governor, employing the inertia of the fluid in motion and under pressure to move the valve of the steam reversing cylinder toward midgear on the smallest increase of the speed of the engine, so linking up all three cylinders in that direction to the required amount to check the speed of the engine. The machinery for all these adjustments is of a small and very simple character, and of a class in which I have had large experience, and for all details there are ample precedents.

The advantages of the gear are its simplicity of construction and fewness of parts, all such parts also being of ordinary form commonly in use, with the further advantage that, as only one eccentric is required for each valve, that may be made of double strength and surface, if desired.

Resulting from the above, the gear is very much less costly than link or other gear, fully by half, as not only are there fewer parts, but none of these are complicated and costly forgings, as motive links, requiring difficult and expensive tooling; almost all the work consisting of simple castings in steel or iron, and requiring chiefly boring and turning, the easiest and least costly operations in the tool shop. Then, having far fewer parts, it is less liable to break down; less attention and lubrication are required. Indeed, if wished, the whole of the lubrication on the crank shaft may be performed by the motive fluid itself (using oil), which may be recuperated automatically by the engine itself while in motion.

Again, it fits into the position of the link gear exactly, requiring no alteration whatever in the ordinary type of engine. Further, the newly designed part connected with the fluid

pressure machinery may entirely break down without destroying the efficiency of the engine, which will still continue her voyage in full forward gear; for if the engine is working expansively, the only result of the entire failure of the fluid gear is to allow the engine to slip into full forward gear, while if working in full gear, there is no strain at all upon that part of the machinery.

And now, though this gear was originally and specially designed for marine engines, it is really a valve gear of general application for any class of

ent of weather or tide; but most of all, a much more crucial and varied series of tests may be crowded into a very much shorter time than with engines at sea. Thus the engine fitted with this gear has been at work about a year and during that time has had the reversing gear as frequently manipulated, shifted from forward to backward going, and changed about to all degrees of expansion as could have occurred in a Channel steamer in six or seven years, or as in an ocean going steamer in quite an unknown time.

erated. This never has existed, for, whether running slowly or very fast, and even with a considerable amount of air in the pipes, the whole gear runs with the solidity of a gear of steel with no intervening fluid. The most suitable fluid to be employed has also been subjected to investigation, and if frost is not feared, and lubrication is not contemplated, then any non elastic fluid will do, but probably one of oil and nine of water will be found most convenient and cheap.

For packings I, of course, used the ordinary leather cap packings, of which I have had very satisfactory experience under pressures up to 5000 pounds per square inch. The practice in the case of the Westinghouse brake pointed in the same direction; but, thinking it well to be independent of organic material, I have been trying to get at a figure in which to employ metal, and some of the results are on the table.

Natural Gas Consumption.

The annual report of Special Agent Joseph D. Weeks of the United States Geological Survey for the year 1893 discloses the fact of the growing confinement of the consumption of natural gas to domestic use. The only State in which the use of natural gas for manufacturing purposes increased last year is Indiana. This State contains by far the most important gas field, its estimated area of productive gas territory being about 2500 square miles. Moreover, while the supply falls far below the demand in other gas fields, it is stated to be well maintained in Indiana, and supplies are even obtained from thence by factories in other gas territories. The value of the product consumed in Indiana in 1893 was \$5,718,000, against \$4,716,000 in 1892. The total value of natural gas consumed in all parts of the country last year was \$14,346,250, as compared with

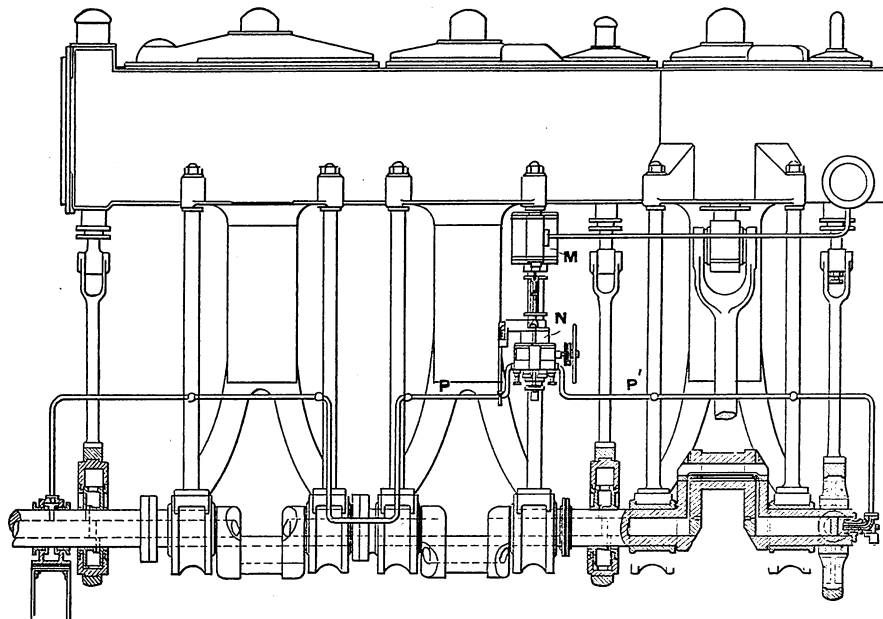


Fig. 1.—Sectional Front Elevation.

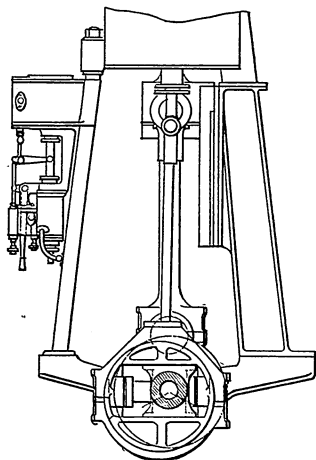


Fig. 2.—End Elevation.

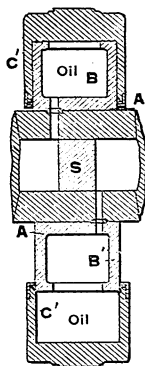


Fig. 3.—Section at Right Angles to Fig. 4.

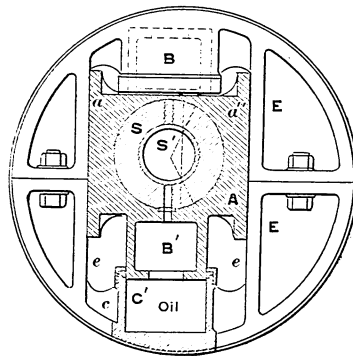


Fig. 4.—Cross Section of Shaft.

THE JOY FLUID PRESSURE REVERSING GEAR.

steam engines and suitable to be employed wherever link gear may be used. Therefore, in selecting an engine on which to test its efficiency, I chose a locomotive, as offering opportunities for the most crucial tests to be carried out in the shortest time, as also other important advantages; as the greater ease with which experiments can be conducted and recorded on land than at sea, the freer access to the machinery by numbers, whether of workmen or of those wishing to inspect, as compared with a crowded engine room at sea. Alterations, repairs or additions may be readily made, variations in loads or in speeds may be effected, continuous working may be maintained, independ-

With regard to the newly required constructive details, several points of interest arose and had to be dealt with. One or two only I will name. Thus it was objected that, at the point where the stationary fluid in the pipes at either end of the crank shaft met that which was revolving rapidly in the shaft, heat would probably be generated. This never occurred, but its possibility was met by enlarging the spaces or channels at that point, so allowing room for the stationary particles to interchange gradually among those rotating rapidly.

Again it was urged that, as the fluid had to sustain the reciprocating effort of pulling and pushing, the valve throbbing or pulsating action would be gen-

\$14,800,714 in 1892. This decrease is attributed to the higher prices charged for the gas in 1893. The falling off in value of the gas consumed has been steady since 1888—the banner year—when \$22,629,875 worth of the fuel was used. Of this output Pennsylvania alone produced the value of \$19,382,375. Last year the output of that State had sunk to \$6,488,000, and all the other States, except Indiana, showed a like decline.

According to the last annual report the Ilseden Hueth, Germany, made its basic pig at 27.93 marks per metric ton, or \$6.65 per gross ton, producing with three furnaces 136,634 metric tons of

pig iron. The Peine Works, of which this is a part, are credited with being the cheapest producers of pig iron on the Continent. The ore yielded 37.8 per cent., and the fuel consumption was 90.8 per cent. of pig iron product. The concern made a gross profit of 1,502,584.73 marks on the Ilse furnaces and 769,215.49 marks on the Peine basic steel works. There was written off 909,902.18 marks, and 430,718.32 marks was placed to reserve. The cost of the plant was 21,369,592.68 marks, on which amount 16,392,152.72 marks has been written off, so that it stands on the books at less than 5,000,000 marks. The capital is 4,426,125 marks, and there are mortgages amounting to 3,644,124 marks, against which there is a working capital on hand of 3,242,809 marks. The concern are one of the most prosperous in Germany.

Power Transmission for Omaha

The problem of making Omaha, Neb., a manufacturing center by means of water power located 7 miles from the city is discussed in the 1893 report of Andrew Rosewater, city engineer. One plan for the development of the power is based on a continuous delivery for 24 hours, and another plan on a delivery for ten hours and a storage of 750 cubic feet per second for ten hours and a storage of the flow during the remaining 14 hours. The former would develop 18,567 horse-power for 24 hours at a cost of \$2,000,000 for development, and the latter 22,279 horse-power for ten hours at a cost of \$1,500,000 for development. The cost per horse-power would be \$80 and \$67.33, respectively.

An electrical plant capable of transmitting the power a distance of 7 miles with an efficiency of 70 per cent. would cost about \$73 per horse-power of net delivery 7 miles from the plant. In the following table an estimate is given of the yearly cost of transmission per horse-power of a 20,000 horse-power plant:

Interest, 5 per cent.; depreciation and repairs, 8 per cent.; attendance and operation, 2 per cent.; taxes and insurance, 1½ per cent.; total, 16½ per cent.; 16½ per cent of \$73 =\$12.05
Estimated cost of canal power, \$9.60, which to deliver one electrical horse-power net must be $\frac{100}{70}$ of \$9.60 = 13.71

Total cost per net horse-power, plan No. 1.....\$25.76
With canal at \$8.08 per horse-power at wheel } $\$8.08 \times \frac{100}{70} = \11.54
shaft, }
Electric transmission per horse-power.. 12.05

Total cost per net horse-power, plan No. 2.....\$23.59

If compressed air is employed, the cost per net horse-power of compressors, receivers and 7 miles of mains for a 20,000 horse power plant, based on 70 per cent. efficiency, is estimated at \$52.70 per net horse-power, delivered. The annual cost of transmission is approximated as follows: Interest, 5 per cent.; depreciation and repairs, 6 per cent.; attendance and operation, 2 per cent.; taxes and insurance, 1½ per cent.; total, 14½ per cent., which gives \$7.64 as the annual cost of transmission per net horse-power.

Cost of canal power required to develop one net power delivered (plan No. 1).....\$13.71
Cost of transmission..... 7.64
Cost of coal for reheating..... .80

Total.....\$22.15

Canal horse-power, per plan No. 2 11.54
Cost of transmission..... 7.64
Cost of coal for reheating..... .80

Total.....\$19.98

The above includes the cost of coal for reheating at point of consumption to compensate for loss in transmission.

The following table gives the estimated cost of 1 horse-power generated by steam in Omaha, January, 1894:

Description of plant.	Net horse-power.	Tons of 2,000 pounds slack consumed per hour.	Cost of slack per horse-power per year of 308 days, ten hours each, at \$1.65 per ton.	Approximate cost of engineer, fireman, supplies and repairs per horse-power per year of 308 days.	Approximate cost of insurance, interest, tax and depreciation per horse-power per annum.	Approximate total cost per horse-power per annum.
Omaha Street Railway.....	1,500	5.71	\$19.34	\$6.00	\$6.33	\$31.67
* Florence Station Omaha Water Works...	911	1.533	8.83	6.00	6.33	21.16
Izard Street Station Omaha Water Works..	266	0.91	17.40	7.85	7.77	33.02
Broadway Station County Bluffs Water Works.....	215	0.83	19.62	8.92	8.01	\$6.55
Walnut Hill Station Omaha Water Works...	122	0.33	13.72	15.15	8.77	37.64
Woodman's Linseed Oil Works.....	100	0.50	25.41	15.15	8.77	49.33
County Bluffs Bridge & Motor Company....	100	0.455	23.12	15.15	8.77	47.04
Twentieth and Poppleton Station, Water Works.....	66	0.409	31.49	25.87	10.39	67.75
River Station County Bluffs Water Works..	63	0.60	48.40	25.87	10.39	84.66
Lincoln Street Railway.....	425	.....	22.76	9.65	7.10	39.51
Phoenix Foundry, Omaha.....	50	.....	.....	.....	.....	.....

The cost of coal was deduced from approximate data obtained at the various installations mentioned. The remaining expenses were approximately deduced from statements and tables of steam engineering experts.

* Triple expansion engines.

The conclusions reached by Mr. Rosewater are as follows:

1. There is over 50 per cent. loss sustained in the operation of power plants as generally used.

2. This power can be more economically secured through large central power installations.

3. That with the existing conditions at Omaha, water power is cheaper than steam power.

4. As between electricity and compressed air as a mode of transmission, for lighting and electric railway purposes, an electrical installation of sufficient capacity directly connected with the water wheel will be preferable. For general power purposes, on the grounds of greater safety and ease of application, constancy of operation and freedom from jerks, which are complained of even where large fly wheels in electric transmission are used, compressed air would be more desirable and economical.

The Generation of Steam by the Use of Blast Furnace Gases.*

BY J. WEIDMAN MURRAY.

The utilization of blast furnace gases in the generation of steam has never received the attention and study at the hands of either the blast furnace engineer or the blast furnace manager that its importance would justify.

The furnace that has an adequate amount of steam, even under normal conditions, without resorting to firing is the exception rather than the rule.

There are many reasons for this condition of things, but there are several that have so frequently come to my notice that I deem them worthy of mention at this time. The first is the faulty method of introducing the gases. The second is the improper combination of same.

In many cases the gases are introduced through burners in each of the forward corners of the battery on the ground level. By this means the gases are allowed to travel a distance of from 10 to 12 feet before they come in contact

with the heating surface of the boiler, thereby causing the loss of that much valuable surface. Then, too, locating the burners as described leaves an inadequate space for grate surface, which latter is indispensable, either when

blowing in the furnace or at such times when the gases are thin.

The best results have been attained where the gases are introduced inadequately under and close to the boiler, in a broad thin flame, admitting the air for combustion around the nose of the burner, either by means of small registers or by making the slots in the fronts, where the burners are inserted, large enough to allow all the necessary air for combustion to pass in on all sides and mix with the gases at the nose of the burner.

The quantity of gas can be regulated by means of a sliding damper where the burner is fixed, or the use of the Spearman-Kennedy gas burner, these latter having proven very satisfactory wherever tried.

Several years since I was obliged to dismantle a worn out battery of boilers at the Alice Furnaces, consisting of two 46-inch diameter return flue boilers 34 feet long. Being short of steam much of the time I was extremely anxious to secure the greatest amount of generating surface that the limited space would admit. The available floor space for those boilers was fixed, as they had to be placed between two other batteries then in service. Their elevation, too, was limited, as we had to be governed by the position of a continuous breeching running along the entire length of the boiler plant, to which we were obliged to make connection for the conveying off of the waste gases.

The idea struck me that in designing the new boilers it would be well to build them as large as circumstances would admit, in order to gain generating surface. Then, to still further increase the latter, to suspend a plain cylinder heater under each boiler. By this means we would utilize the major part of the heat thrown out from the superheated wall (much of which was going to waste) as well as put to use what usually is a dead space under the boilers.

This battery, as built, consists of two 54-inch diameter return flues. Immediately under and connected to each of these boilers is a plain cylinder heater 36 inches diameter by 31 feet 2 inches long. These heaters start 8 feet from the front end of the boilers thereby giving ample space for grate surface

* A paper read before the Alabama Industrial and Scientific Society.

and bridge wall, which latter is run up high enough to prevent the incoming gases from striking direct against the forward heads of the heaters. These heaters pass through and beyond the rear walls of the battery a distance of 2½ feet. From the under side of these at the extreme rear ends is suspended a 20-inch diameter mud drum. The heaters are hung so as to give them a fall of 6 inches from the forward end to the points to which the mud drum is suspended. The object of extending these heaters through the rear walls of the battery was to secure a point for hanging the mud drum away from the heater where there would be no agitation, and at the lowest point in the heater, thereby forming a natural point of deposit for the sediment. In our experience with these boilers our hopes in this direction have been fully realized, all sediment collected in the boilers having deposited itself in the mud drum, and in that portion of the heater not subjected to the burning gases and at a point where its presence does no material harm. The mud drum is connected to the under side of the heaters by means of 10-inch diameter built legs. A 30-inch diameter steam drum lies across the top of the boilers, and is connected to the latter by means of 14-inch diameter built legs. These drums form perfect equalizers to both the steam and the water between the two boilers.

The same settings, hangings, and about the same amount of brick were used in constructing this battery as that used in the dismantled battery.

The double deck boilers gave us 1660 square feet of generating surface as against 1040 square feet in the dismantled boilers, or a gain of 61 per cent. The supplementary heater affords us a gain of 59 per cent. over that we would have by simply using the 54 inch diameter return flue boiler, without any additional cost to the plant other than the absolute cost of the heater with its connections, which is but 12 per cent. of the cost of the finished battery.

Our experience with this, the first battery of this type of boiler, taught us that better results could be attained by introducing a jet of gas under the heaters in addition to the one under boilers. So when we found it necessary to still further increase the boiler capacity of the Alice Furnaces by two additional double deck batteries of boilers, I designed a duplex gas burner. The upper burner is covered by the Spearman-Kennedy patents. The connection for the lower burner is made to the stationary base of the upper burner, leading the gas through a 9 x 9 inch cast pipe, located immediately under the grate bars, to a cast nozzle built in the bridge wall and measuring 24 x 3 inches at the nose. The air for combustion is admitted from either side of the battery through the superheated walls to a small chamber encircling the burner nozzle. This chamber is reduced, giving 1 inch of space on all sides of said nozzle, at which point the air mixes with the gases and causes combustion.

Our experience, as well as that of some of our neighbors, has been very flattering, both with the duplex boilers and the duplex burners.

A press dispatch from Colorado City, Col., dated May 24, states that at a depth of 1275 feet a flow of gas estimated at 40,000 cubic feet was struck in well No. 1 of the Colorado City Oil Company. The promoters of the enterprise are confident of finding oil in abundance.

Replies to Tariff Hearings.

A series of bulletins has been issued by the Senate Finance Committee, containing the replies to a series of questions asked by the chairman of that committee. A good many very interesting facts in regard to production and prices are given which are of value to the trade. We cull from the enormous mass of material the following data:

The Mount Pleasant Mining Company of Port Oram, N. J., report that the price of their ore declined from \$4.50 in 1886 and 1887 to \$4.30 in 1888, \$4.25 in 1889, \$4.20 in 1890, \$3.85 in 1891, \$3.80 in 1892, and \$3.25 in 1893. Early in 1894 it was sold with difficulty at \$3.20.

Witherbee, Sherman & Co. and the Port Henry Furnace Company state that Lake Champlain magnetite ore in 1884 averaged \$3.12, in 1890 \$2.92, in 1892 \$2.72, and 1894 is \$2.26.

The E. & G. Brooke Iron Company of Birdsboro, who were established in 1740, report that when the works are in full operation they can produce 70,000 tons of pig iron, 250,000 kegs of nails and 10,000 tons of muck bars for sale. The product in 1893 was 35,749 tons pig iron, 196,651 kegs nails and 3747 tons muck bars sold. In 1892 the product was considerably more, but not up to the capacity of the works. The value of the product has been decreasing. The works have not been running full time during the last two years on account of falling prices.

The product of pig iron of the Chickies Iron Company, manufacturers of pig iron, now idle, since 1872 has been as follows:

Year.	Tons.	Value.	Year.	Tons.	Value.
1872	8,967½	\$402,461.40	1883	12,705½	\$262,368.57
1873	8,785	326,626.30	1884	12,280	229,022.00
1874	9,939½	276,735.16	1885	12,988½	213,401.05
1875	11,797½	274,291.87	1886	9,591½	165,261.54
1876	12,056	244,254.56	1887	13,645½	250,122.02
1877	10,651½	176,850.84	1888	17,121½	294,489.80
1878	8,703½	147,524.33	1889	18,711½	307,804.18
1879	12,203½	223,079.98	1890	25,646½	415,216.84
1880	12,350½	314,814.24	1891	22,639	354,689.67
1881	9,847½	230,288.58	1892	22,580	313,862.00
1882	9,240	222,684.00	1893	11,509½	154,917.87

The price of fuel was \$3.25 in 1884, \$3.55 in 1890 and \$3.16 in 1892. Ore was \$3.37 in 1884, \$3.96 in 1890 and \$2.21 in 1892.

An interesting statement concerning product of pig iron and value comes from the Citico Furnace Company of Chattanooga, Tenn. The figures are as follows:

Year.	Tons.	Total value.	Value per ton.
1884	10,600	\$141,040.72	\$13.33
1885	18,550	221,115.79	11.95
1886	20,926	258,211.02	12.34
1887	22,756	347,029.15	15.25
1888	22,132	287,703.14	13.00
1889	30,180	354,056.42	11.75
1890	24,496	277,519.79	11.33
1891	29,914	333,556.30	11.16
1892	27,392	273,786.90	10.10
1893	23,645	209,667.72	8.87

D. G. Cook of Glen Wilton, Va., reports the production of pig iron has been as follows:

Year.	Tons.	Value.
1885	8,729	\$120,497
1886	10,484	153,342
1887	13,092	221,543
1888	12,002	146,352
1889	13,589	192,452
1890	12,247	184,436
1891	12,536	175,190
1892	13,379	175,005
1893	11,929	139,136

The furnace stopped in 1893. Mr. Cook says: "We employ from 150 to

225 men. Ordinary labor is paid 90 cents; miners, \$1 to \$1.10; furnacemen, \$1.05 to \$1.50 per day. If we start now we must reduce wages 15 per cent."

Another Southern producer of pig iron, the Roane Iron Company of Rockwood, Tenn, puts on record the following:

Year.	Tons.	Value.	Price per ton.
1883	27,794	\$349,916.65	\$12.60
1884	25,892	319,694.94	12.23
1885	28,280	328,330.80	11.61
1886	18,858	244,022.52	12.94
1887	16,343	247,597.10	15.15
1888	18,233	253,803.36	13.92
1889	30,167	365,324.19	12.11
1890	25,968	320,064.48	12.36
1891	30,586	356,022.74	11.64
1892	23,562	243,865.13	10.35
1893	12,161	108,352.24	8.91

The furnace stopped in 1893 for remodeling.

The Virginia Iron & Railway Company of Goshen Bridge, Va., report as follows: "Production: Year 1891, 32,114 tons pig iron (2240 pounds per ton); net price at furnace, \$12.52. Year 1892, 38,000 tons; net price at furnace, \$11.25 per ton. Year 1893, 16,114 tons; net price at furnace, \$8.97 per ton. Works closed down September 15, 1893. Could not sell product at any price. Owing to general stagnation in business, firms that did buy could not pay for iron, and prices dropped from \$1 to \$2.25 below cost of production."

The Mahoning Valley Iron Company of Youngstown submit the following figures relating to their production of bars, angles, nails, pipe, plate, sheet, nail plate and polished shafting:

Years.	Tons of 2,000 pounds.	Value.
1887-88	42,366	\$1,596,942.05
1888-89	41,823	1,472,392.87
1889-90	44,233	1,632,800.81
1890-91	50,195	1,727,474.78
1891-92	49,967	1,717,399.64
1892-93	52,913	1,744,592.31

They add: "July 1 to December 31, 1893, mills closed on account of tariff legislation."

The Ohio Falls Iron Company of New Albany, Ind., put on record their production and its value:

Year.	Tons.	Value.	Year.	Tons.	Value.
1876	4,302	\$219,692.00	1885	5,041	\$202,566.00
1877	5,284	236,725.00	1886	5,662	219,119.00
1878	5,235	213,064.50	1887	8,513	371,166.80
1879	6,793	310,779.00	1888	6,021	254,065.00
1880	6,416	313,894.00	1889	7,170	260,988.00
1881	8,107	428,049.60	1890	8,506	337,092.78
1882	8,403	421,850.60	1891	6,204	230,850.00
1883	5,606	264,753.00	1892	7,915	279,762.00
1884	3,948	160,678.00	1893	9,836	360,761.00

They ran full time with increased capacity from January 1 to October 1, 1893, and after that one-third time.

The Pottsville Iron & Steel Company of Pottsville, Pa., manufacturers of iron and steel shapes, report their sales for the last five years as follows: In 1889, \$1,065,870.27; 1890, \$1,447,600.46; 1891, \$1,092,027.47; 1892, \$1,229,006.31; 1893, \$833,197.35.

The business done by the Pottstown Iron Company of Pottstown, makers of nails, steel billets and slabs and steel plates, is reported as follows:

Year.	Tons.	Value.	Year.	Tons.	Value.
1886	17,845	\$820,478.17	1890	39,960	\$1,675,544.45
1887	25,803	1,170,746.62	1891	60,957	2,368,547.19
1888	30,747	1,228,856.83	1892	70,278	2,600,610.03
1889	33,658	1,313,789.73	1893	43,525	1,434,565.75

The Spang Steel & Iron Company of Pittsburgh, Pa., manufacturers of steel and iron plate, billets, &c., give the tonnage and value of goods made by them:

Year.	Tons.	Value.	Year.	Tons.	Value.
1890	20,905	\$974,371.41	1892	22,769	\$606,149.67
1891	19,456	742,631.00	1893	11,559	417,570.18

During the year 1892 they ran their plant about one-half time. During 1893 they did not run over one-quarter time. Their business commenced going down during the latter part of 1892. They attribute the falling off to the uncertainty of the action of Congress on the question of tariff.

The St. Louis Steam Forge & Iron Works of St. Louis, manufacturers of car axles and forgings, make the following report of production in recent years:

Year.	Car axles.		Value of other products.
	Number.	Value.	
1888	14,110	\$130,276	\$14,406
1889	17,840	161,702	5,474
1890	19,473	179,950	8,740
1891	17,900	161,453	13,788
1892	21,700	205,280	11,586
1893	12,780	108,690	16,923

They add: "In 1893, from July to December, we were running about one fifth time, because the panic made it impossible to secure orders. Car axles were \$2.50 per 100 pounds in 1884; \$2.30 in 1890; \$2.10 in 1892, and \$1.60 now."

The Union Iron & Steel Company of Youngstown and Pomeroy, Ohio, manufacturers of hoops, bands and bars, give the following records of production for their fiscal years ending June 30:

Year.	Product (net tons).	Total price.	Average price (net ton).
1888	70,017	\$2,684,000.59	\$38.33
1889	70,285	2,566,912.01	36.52
1890	86,573	3,254,966.81	37.59
1891	108,661	4,084,893.74	37.80
1892	131,689	4,681,211.90	35.65
1893	130,181	4,265,848.55	32.77

The Aetna-Standard Iron & Steel Company of Bridgeport, Ohio, established in 1873, and having a capital of \$2,000,000, make the following interesting comparison between their sales in 1873 and 1893:

	Tons.	Value.
First year:		
Bar iron	2,118	\$116,600
Black sheets	350	26,600
Crude products	1,300	2,800
Totals	3,768	\$146,000
Last year:		
Galvanized sheets	1,900	\$145,000
Painted corrugated sheets	2,428	150,000
Black sheets	30,397	1,393,000
Bars, light rails and light structural shapes	19,745	663,600
Crude products	21,947	190,000
Totals	76,417	\$2,541,600

"We operated full until last June, since then about one-third time. Reduced output was occasioned by decreased demand for our products, resulting, as we believe, in part from

financial disturbance, but especially from fear of unfavorable tariff legislation."

The following interesting comparison of prices in the month of January in each of the years is made.

	1884.	1890.	1892.	1894.
Iron bars, base sizes	1.70	1.75	1.60	1.15
Steel angles, base sizes	(*)	2.25	1.75	1.25
Steel T's, base sizes	(*)	2.50	2.05	1.35
Galvanized sheets No. 28 wire gauge	(*)	5.52	4.54	3.62
Corrugated and painted sheets No. 27	(*)	3.75	3.35	3.00
Black sheets:				
Steel No. 28	4.75	3.35	3.10	2.40
Steel No. 12	(*)	2.50	2.00	1.40
Iron No. 12	2.35	2.15	2.10	(*)
Iron No. 28	3.20	3.00	3.00	2.35

* Not made.

In this table prices of sheets are given on gauges in which most tonnage is made and sold.

A particularly interesting series of figures is that showing the steel product for the fiscal years ending August 1 of Park, Bro. & Co., Limited, of Pittsburgh, manufacturers of bar, plate and sheet steel and copper.

Years.	Pounds.	Value.
1874	7,670,701	\$968,017.73
1875	8,391,131	968,408.94
1876	9,561,536	1,030,562.21
1877	10,708,903	997,866.50
1878	17,551,773	1,324,583.58
1879	19,776,468	1,350,387.06
1880	27,479,264	1,950,301.16
1881	32,185,402	2,277,161.03
1882	34,072,823	2,612,269.04
1883	35,203,704	2,417,882.68
1884	38,677,239	2,363,899.63
1885	39,491,868	1,849,323.29
1886	65,474,819	2,684,489.13
1887	85,002,635	3,390,027.32
1888	97,257,474	3,454,001.08
1889	110,426,551	3,704,842.55
1890	130,593,293	4,366,379.61
1891	127,222,407	4,096,630.70
1892	134,065,674	3,937,578.72
1893	150,680,584	4,097,131.11

They say: "We have during the past two years been running full time, and on double turn until July last, when the period of great depression began.

"We manufacture a great variety of grades of steel, but for the purpose of this inquiry we will name prices for our four leading articles of manufacture:

	February.			
	1884.	1890.	1892.	1894.
Flange boiler steel	Cts. 3 1/2	Cts. 3	Cts. 2 3/10	Cts. 1 4/10
Open hearth railway spring steel	2 5/8	2 1/2	2	1 5/10
Carriage spring steel	2 3/4	2 1/2	2 1/2	1 9/10
Tool steel	9	6 1/2	5 1/2	5 1/2

"Owing to the increased capacity of our works we are producing as much as we were in 1892, but in many of the older departments of our business our trade has fallen off, owing to the general unsatisfactory condition of business throughout the country."

The Marshallton Iron Works of Marshallton, Del., established in 1836, report their productions in recent years as follows:

Year.	Sheet iron.		Pans, &c.
	Tons.	Value.	
1889	2,313	\$143,981	
1890	2,479	158,323	\$39,046
1891	3,053	191,575	32,403
1892	2,964	182,520	38,370
1893	3,393	197,000	16,852

Have been running full time to January 1, 1894; since then, not at all. Ran during 1893 with a continual falling market, and lost \$25,000. Always prior to 1893 business was profitable. Average prices of sheet iron per pound have been as follows: 1884, 3.65 cents; 1890, 2.85 cents; 1892, 2.75 cents; 1893, 2.40 cents.

Trade Publications.

THE CRANE COMPANY, CHICAGO, have issued illustrated circulars calling attention to their line of extra heavy globe valves, gate valves and fittings for high pressures. These are intended to meet the requirements of the trade growing out of the introduction of compound and triple expansion steam plants, which involve the use of valves and fittings thoroughly reliable under the trying conditions of such service. The special valves and fittings to which reference is here made are designed for a working pressure of 200 pounds, and great care has been given to every detail to meet the strain due to expansion and contraction. All sizes and special conditions of application and connection are covered. Crane's patent noiseless back pressure valves are also shown. These are designed for both condensing and non-condensing engines, to overcome the objectionable and destructive hammering peculiar to the common back pressure valve.

THE GARDEN CITY SAND COMPANY Rooms 1009 and 1010 Security Building, Chicago, have just issued a very handsome catalogue of the specialties they handle in the line of fire brick for blast furnaces, steel works and rolling mills; sand for use in rolling mills and steel works; molders' sand, foundry supplies, &c. The catalogue is beautifully illustrated in the latest style of engraving. Cuts are shown of a great variety of shapes of fire brick, including water tube boiler blocks, locomotive fire box tiles, paving and floor brick and cupola blocks. The company's molding sand comprises all leading brands of molding and core sand for every kind of foundry work.

UNDER THE TITLE of "A Few Words on the Handling of Dynamos, Generators and Motors," Edwin Harrington, Son & Co., Incorporated, of Philadelphia, have issued a little 12 page pamphlet for distribution to those interested in electric light and power. The pamphlet calls attention to their machinery for handling dynamos, and illustrates their hoists, traveling cranes, radial arms, turn tables and transfer systems.

GISHOLT MACHINE COMPANY of Madison, Wis., send a pamphlet entitled "Modern Turret Lathe Practice." It illustrates and describes a 42-inch gap lathe turning plate couplings; a 2 inch spindle turning machine turning elevating screws; a 28-inch standard turret lathe turning Corliss engine bonnets, and a 2 1/2-inch screw machine turning shoulder studs. In the preface it is stated that this pamphlet will be issued monthly and will contain illustrations of some of the uses to which the turret lathes made by this company are put.

J. A. FAY & Co. of Cincinnati, Ohio, have published a small catalogue entirely devoted to wood workers' machinery supplies. This catalogue will be of great service to all those who have charge of wood working machinery.

THE LODGE & SHIPLEY MACHINE TOOL COMPANY of Cincinnati, Ohio, have gotten up a catalogue fully describing and illustrating some of the tools built by them. The preface says: "Great thought has been expended on the rapid production of all work manufactured by the screw machine. We manufacture that class of machinery and also apply the same principle to cast iron work up to 30 inches diameter. This includes such work as the details of slide valve and Corliss engines, pumps, iron valves, cotton and printing presses, sugar machinery, blank gears, couplings, pulleys, bridge pins, and an infinite variety of work requiring to be chucked, and to have more than one operation of turning or boring

performed on it." Among the machines described are 30-inch double saddle turret lathe, 60-inch pulley lathe, pulley drilling and tapping machine, 37-inch turret lathe, 22-inch turret chucking lathe, Fox monitor, horizontal and cylinder boring machine, &c.

WE HAVE RECEIVED from August Zaubitz of 48 Centre street, New York, a catalogue describing his steam, vacuum, hot blast and hydraulic gauges, and also his stationary hot blast and portable pyrometers for indicating the temperature of the hot blast in smelting iron, also for tempering and annealing ovens, galvanizing and lead bath, boiler flues, &c. The catalogue also describes engine registers and clocks for engine rooms, and high grade thermometers.

Changes in the Metal Schedule.

The metal schedule, which was under discussion in the Senate during the past week, has been completed by that body. We compile the following from the *Congressional Record*.

Among the changes not recorded by us is the following, the present rates being bracketed :

111. Round iron, in coil or rods, less than 7-16 inch in diameter, and bars or shapes of rolled iron, not specially provided for in this act, 8-10 cent (1.1 cents) per pound: Provided, That all iron in slabs, blooms, loops, or other forms, less finished than iron in bars, and more advanced than pig iron, except castings, shall be subject to a duty of 5-10 cent (0.8 cent) per pound; Provided further, That all iron bars, blooms, billets, or sizes or shapes of any kind, in the manufacture of which charcoal is used as fuel, shall be subject to a duty of not less than \$12 per ton (\$22). The Senate Finance Committee rate was 25 per cent, and that of the Wilson bill 22½ per cent, ad valorem.

On structural material the following amendment was adopted, the present rate being bracketed:

113. Beams, girders, joists, angles, channels, car truck channels, T, columns and posts or parts or sections of columns and posts, deck and bulb beams and building forms, together with all other structural shapes of iron or steel, whether plain or punched, or fitted for use, 6-10 cent per pound (0.9 cent). The Wilson rate was 30 per cent., and the Senate Finance Committee rate was 35 per cent, ad valorem.

The forgings paragraph now stands as follows, the present rate in brackets:

115. Forgings of iron or steel, or forged iron or steel combined, of whatever shape, or in whatever stage of manufacture, not specially provided for in this act, 1½ cents (2.3 cents) per pound: Provided, That no forgings of iron or steel, or forgings of iron and steel combined, by whatever process made, shall pay a less rate of duty than 35 per cent. (45 per cent.) ad valorem. The Senate Committee rate was 30 per cent., and the Wilson act 25 per cent, ad valorem.

The rate on rails proposed is as follows:

117. Railway bars, made of iron or steel, and railway bars made in part of steel, T-rails, and punched iron or steel flat rails, 7-20 cent per pound. The present rate is 0.6 cent. The Wilson proposal was 20 per cent, and the Senate Finance Committee 22½ per cent.

The sheet iron clause under the Jones amendment reads as follows, present rates bracketed:

Sheets of iron or steel, common or black, including all iron or steel commercially known as common or black taggers iron or steel, and skelp iron or steel, valued at 3 cents per pound or less, thinner than No. 10 and not thinner than No. 20 wire gauge, 7-10 cent (1 cent) per pound; thinner than No. 20 wire gauge and not thinner than No. 25 wire gauge, 8-10 cent (1.1 cents) per pound; thinner than No. 25 wire gauge, 1.1 cents (1.4 cents) per pound; corrugated or crimped, 1.1 cents (1.4 cents) per pound: Provided, That all common or black sheet iron or sheet steel not thinner than No. 10 wire gauge shall pay duty as plate iron or plate steel. The Wilson rate was 35 per cent, ad valorem.

On galvanized sheets the Jones amendment is as follows, present rates bracketed:

119. All iron or steel sheets or plates and all hoop, band, or scroll iron or steel, excepting what are known commercially as tin plates,terne plates and taggers tin, and hereinafter provided for, when galvanized or coated with zinc or spelter, or other metals, or any alloy of those metals, shall pay ¼ cent (0.75 cent) per pound more duty than the rates imposed by the preceding paragraph upon the corresponding gauges or forms of common or black sheet or taggers iron or steel. The Wilson and Senate Finance Committee rates were 35 per cent., ad valorem.

On planished steel the Jones amendment reads, present rates bracketed:

120. Sheet iron or sheet steel, polished, planished or glanced, by whatever name designated, 1½ cents (2.5 cents) per pound: Provided, That plate or sheet or taggers iron or steel, by whatever name designated, other than the polished, planished or glanced, herein provided for, which has been pickled or cleaned by acid, or by any other material or process, or which is cold rolled, smoothed only, not polished, shall pay ¼ cent (0.25 cent) per pound more duty than the corresponding gauges of common or black sheet or taggers iron or steel. The Wilson and Senate Finance Committee rate was 35 per cent.

The tin plate amendment is left as it stood in the Wilson bill, as follows:

121. Sheets or plates of iron or steel, or taggers iron or steel, coated with tin or lead, or with a mixture of which these metals, or either of them, is a component part, by the dipping or any other process, and commercially known as tin plates,terne plates and taggers tin, 1-1.5 cents per pound: Provided, That the reduction of duty herein provided for shall take effect on and after October 1, 1894. No article not specially provided for in this act, wholly or partly manufactured from tin plate,terne plate or the sheet, or plate iron or steel herein provided for, or of which such tin plate,terne plate, sheet, or plate iron or steel shall be the material of chief value, shall pay a lower rate of duty than that imposed on the tin plate,terne plate, or sheet, or plate iron or steel from which it is made, or of which it shall be the component thereof of chief value. The present rate is 2.2 cents per pound.

The steel clause reads under the Jones amendment as follows, present rates bracketed:

122. Steel ingots, clogged ingots, blooms and slabs, by whatever process made; die blocks or blanks; billets and bars and tapered or beveled bars; steam crank and other shafts; shafting; wrist or crank pins; connecting rods and piston rods; pressed, sheared or stamped shapes; saw plates, wholly or partially manufactured; hammer molds or swaged steel; gun barrel molds not in bars; alloys used as substitutes for steel in the manufacture of tools; all descriptions and shapes of dry sand, loam, or iron molded steel castings; sheets and plates not specially provided for in this act, and steel in all forms and shapes not specially provided for in this act. All of the above valued at 1 cent per pound or less, 3-10 cent (0.4 cent) per pound; valued above 1 cent and not above 1.4 cents per pound, 4-10 cent (0.5 cent) per pound; valued above 1.4 cents and not above 1.8 cents per pound, 6-10 cent (0.8 cent) per pound; valued above 1.8 cents and not above 2.2 cents per pound, 7-10 cent (0.9 cent) per pound; valued above 2.2 cents and not above 3 cents per pound, 9-10 cent (1.2 cents) per pound; valued above 3 cents per pound and not above 4 cents per pound, 1.2 cents (1.6 cents) per pound; valued above 4 cents and not above 7 cents per pound, 1.3 cents (2 cents) per pound; valued above 7 cents and not above 10 cents per pound, 1½ cents (2.3 cents) per pound; valued above 10 cents and not above 13 cents per pound, 2.4 cents (3.5 cents) per pound; valued above 13 cents and not above 16 cents per pound, 2.8 cents (4.2 cents) per pound; valued above 16 cents per pound, 4.7 cents (7 cents) per pound. The Senate Finance Committee and Wilson rate was 25 per cent.

The wire rod clause reads, as amended, the present rates being bracketed:

123. Wire rods: Rivet, screw, fence and other iron or steel wire rods, whether

round, oval, flat or square, or in any other shape, and nail rods in coils or otherwise, valued at 4 (3½ cents) cents or less per pound, 4-10 (0.6 cent) cent per pound; valued over 4 cents per pound, ½ cent per pound; Provided, That all round iron or steel rods smaller than No. 6 wire gauge shall be classed and dutiable as wire. The Wilson and Senate rate was 25 per cent.

It was to the wire clause that the extraordinary provision was added making barbed wire free. As passed, the article reads, present rates bracketed:

Wire: Round iron or steel wire, all sizes not smaller than 13 wire gauge, 1½ cents per pound; smaller than 13 wire gauge, and not smaller than 16 wire gauge, 1½ cents per pound; smaller than 16 wire gauge, 2 cents per pound; all other iron or steel wire and wire or strip-steel, commonly known as crinoline wire, corset wire, drill rods, needle wire, piano wire, clock and watch wires, and all steel wires, whether polished or unpolished, in coils or straightened, and cut to lengths, drawn cold through dies, and hat wire, flat steel wire or sheet steel in strips, uncovered or covered with cotton, silk or other material, or metal, and all the foregoing manufactures of iron or steel, of whatever shape or form, valued above 4 cents per pound, shall pay a duty of 40 per cent, ad valorem: Provided, That articles manufactured from iron or steel wire shall pay the maximum rate of duty which would be imposed upon any wire used in the manufacture of such articles and in addition thereto 1 cent per pound: Provided further, That barbed wire, commonly used for fencing, shall be admitted free of duty.

126. Anchors, or parts thereof, of iron or steel, mill irons and mill cranks or wrought iron, and wrought iron for ships, and forgings of iron or steel, or of combined iron and steel, for vessels, steam engines and locomotives, or parts thereof, 1.2 cents per pound. The present rate is 1.8 cents per pound. The Senate and Wilson bills made it 25 per cent.

127. Axles, or parts thereof, axle bars, axle blanks, or forgings for axles, whether of iron or steel, without reference to the stage or state of manufacture, 1½ cents (present rate 2 cents) per pound: Provided, That when iron or steel axles are imported fitted in wheels, or parts of wheels, of iron or steel, they shall be dutiable at the same rate as the wheels in which they are fitted. The Senate and Wilson rate was 25 per cent.

128. Anvils of iron or steel, or of iron and steel combined, by whatever process made, or in whatever stage of manufacture, 1½ cents per pound (present rate 2½ cents). The Wilson and Senate rate was 25 per cent.

129. Blacksmiths' hammers and sledges, track tools, wedges and crowbars, whether of iron or steel, 1½ cents per pound (present rate 2½ cents).

130. Boiler or other tubes, pipes, flues, or stays of wrought iron or steel, 25 per cent, ad valorem.

131. Bolts, with or without threads or nuts, or bolt blanks, and finished hinges or hinge blanks, whether of iron or steel, 1½ cents per pound (present rate 2½ cents) per pound.

133. Cast iron pipe of every description 0.6 cent per pound (present rate 0.9 cent). Wilson bill 25 per cent., Senate Finance bill 22½ per cent.

134. Cast iron vessels, plates, stove plates, andirons, sadirons, tailors' irons, hatters' irons, and castings of iron, not finished parts of machinery, and not specially provided for in this act, 8-10 cent per pound (present rate 1.2 cents per pound). Wilson and Senate bill 25 per cent.

135. Castings of malleable iron not specially provided for in this act 0.9 cent per pound (present rate 1.75 cents per pound). Wilson and Senate bill 28 per cent.

137. Chains of all kinds, made of iron or steel, not less than ¼ inch in diameter, 1.2 cents per pound (present rate 1.6 cents); less than ¼ inch and not less than ⅜ inch in diameter, 1.4 cents (1.8 cents) per pound; less than ⅜ inch in diameter, 2 cents per pound (2.5 cents); but no chain or chains of any description shall pay a lower rate of duty than 35 (45 per cent.) per cent, ad valorem. The Wilson and Senate bills make this 30 per cent.

The cutlery paragraph stands in the Jones amendment as follows:

138. Pen knives, pocket knives, or erasers, of all kinds, valued at no more than 30 cents per dozen, 25 per cent, ad valorem; valued at more than 30 cents per dozen and not ex-

ceeding 50 cents per dozen, 12 cents per dozen; valued at more than 50 cents per dozen and not exceeding \$1 per dozen, 25 cents per dozen; valued at more than \$1 per dozen and not exceeding \$1.50 per dozen, 40 cents per dozen; valued at more than \$1.50 per dozen and not exceeding \$3 per dozen, 75 cents per dozen; valued at more than \$3 per dozen, 50 per cent. ad valorem; and in addition thereto, on all the foregoing valued at more than 30 cents per dozen and not less than \$3 per dozen, 25 per cent. ad valorem: Provided, that blades, handles, or any other parts of any or either of the articles named in this paragraph, imported in any other manner than assembled in pen knives, pocket knives, or erasers, shall be subject to no less rate of duty than herein provided for pen knives, pocket knives, or erasers, valued at more than 30 cents per dozen.

140. Table and carving knives and forks, valued at more than \$4 per dozen pieces, razor and razor blades, wholly or partly finished, and scissors and shears, 45 per cent. ad valorem; all other table knives, forks, steels, and all hunting, kitchen, bread, butter, vegetable, fruit, cheese, plumbers', painters', palette and artists' knives; also all cooks' and butchers' knives, forks and steels, 35 per cent. ad valorem.

141. Files, file blanks, rasps and floats, of all cuts and kinds, 4 inches in length and under, 30 cents per dozen; over 4 inches in length and under 9 inches, 60 cents per dozen; 9 inches in length or over, \$1 per dozen.

154. Crosscut saws, 6 cents (present rate 8 cents) per linear foot; mill saws, 10 cents per linear foot; pit and drag saws, 8 cents per linear foot; circular saws, 25 per cent (30 per cent.) ad valorem; hand, back, and all other saws, not especially provided for in this act, 25 per cent. (40 per cent.) ad valorem.

155. Screws, commonly called wood screws, more than 2 inches in length, 3 cents (present rate 5 cents) per pound; over 1 inch and not more than 2 inches in length, 5 cents (7 cents) per pound; over $\frac{1}{2}$ inch and not more than 1 inch in length, 7 cents (10 cents) per pound; $\frac{1}{4}$ inch and less in length, 10 cents (14 cents) per pound. The Wilson bill made the rate 35 per cent. and the Senate bill 30 per cent.

In the metals, aluminum is made 10 cents per pound under the Jones amendment.

156. Wheels, or parts thereof, made of iron or steel, and steel tired wheels for railway purposes, whether wholly or partly finished, and iron or steel locomotive, car, or other railway tires or parts thereof, wholly or partly manufactured, and ingots, clogged ingots, blooms, or blanks for the same, without regard to the degree of manufacture, $1\frac{1}{2}$ cents per pound: Provided, That when wheels or parts thereof, of iron or steel, are imported with iron or steel axles fitted in them, the wheels and axles together shall be dutiable at the same rate as is provided for the wheels when imported separately.

The lead ore paragraph was adopted as follows:

Lead ore and lead dross, $\frac{1}{4}$ cent per pound: Provided, That silver ore and all other ores containing lead shall pay a duty of $\frac{1}{4}$ cent per pound on the lead contained therein, according to sample and assay at the port of entry. The method of sampling and assaying to be that usually adopted for commercial purposes by public sampling works in the United States.

166. Lead in pigs and bars, molten and old refuse lead run into blocks and bars, and old scrap lead fit only to be remanufactured, 1 cent per pound: Provided, That in case any foreign country shall impose an export duty upon such lead ore or lead dross or silver ores containing lead, exported to the United States from such country, then the duty upon such ores and lead in pigs and bars, molten and old refuse lead run into blocks and bars, and old scrap lead fit only to be remanufactured, herein provided for, when imported from such country, shall remain the same as fixed by the law in force prior to the passage of this act.

167. Lead in sheets, pipes, shot, glaziers' lead, and lead wire, $1\frac{1}{2}$ cents per pound.

Nickel, nickel oxide, alloy of any kind in which nickel is the component material of chief value, 6 cents per pound.

174. Zinc in blocks or pigs, $\frac{1}{2}$ cent per pound.

175. Zinc in sheets, $1\frac{1}{2}$ cents per pound.

176. Zinc, old and worn out, fit only to be remanufactured, $\frac{1}{2}$ cent per pound.

THE WEEK.

The extreme dullness of Pacific grain freights at the present time is phenomenal. Last week the San Francisco *Bulletin* noted the fact that there was not a single wheat ship loading at that port, and that for ten days previously only one wheat cargo had been shipped. The only time in which such a condition of things has prevailed during the past 30 years was in July, 1877.

Four new steamships are to be built in England for employment in the Anglo-Canadian mail service in connection with the Canadian Pacific line. The vessels will be 572 feet in length, 62 feet beam, with a depth of hold of 42 feet and a load draft of 30 feet, making them the deepest transatlantic vessels afloat. This draft of water is rendered possible by the fact that the English and Canadian harbors have deeper water than the harbor of New York. The freight carrying capacity of each of the new ships will be 3550 tons, in addition to a coal bunker capacity of 3000 tons. The engines are to be of 21,000 horsepower, working the vessels to a speed of 20 knots an hour.

The coal supply on the Duluth docks, Duluth, Minn., is reported as shrinking rapidly. Should the present rate of shipment continue the supply cannot last for more than two or three weeks longer.

The Panama Railroad Company, since their disagreement with the Pacific Mail Steamship Company, have made arrangements for operating their own steamer service to Colon. For this purpose three vessels of the defunct Brazil Steamship Company, and now owned by the Standard Oil Company, have been chartered and are being fitted out in the Erie Basin.

The recent rainfall was the heaviest ever recorded in Pennsylvania during the month of May. In five days of last week more rain fell in Philadelphia than during the whole month of any previous year since 1852. The damage caused by floods in the Susquehanna and Schuylkill valleys reached several millions of dollars. Happily the loss of life was comparatively small.

The official returns of the foreign commerce of New York for the month of April show a considerable decrease as compared with the corresponding month of last year. The total figures are: April 1894, \$81,095,074; April 1893, \$101,003,716; a falling off of \$19,908,642. This decrease is mainly due to the loss of imports, which amounted to \$17,273,203, while the movement of specie shows a decrease of nearly \$3,500,000. In merchandise, exclusive of specie, the exports show a gain over last year of nearly \$2,000,000. For the first four months of the calendar year the imports of merchandise reached \$148,511,981, against \$230,948,996 last year, and exports \$116,724,460, against \$100,939,451.

Newport News, Va., the youngest exporting port of the United States, is rapidly advancing to the front rank in importance. Its exports and imports during the past times of dullness and depression are said to have held up phenomenally, thanks to the institution of the Chesapeake & Ohio direct steamship line to Europe, which makes the port its headquarters. The Chesapeake & Ohio Railroad Company have millions of dollars invested in the place,

and it is stated that President Ingalls of that road is about to sail for Europe to engage more steamships for the line.

The increasing number of mysterious fires throughout the country, most of which might be traceable to defective insulation of electric light wires, have stirred up the insurance companies to stimulated action in this matter. An insurance journal records the fact that in the city of Hartford, Conn., the Board of Fire Underwriters have recently employed an expert to make a thorough inspection, with the result of finding 57 stores and offices in the business part of the city, including two large hotels, utterly unsafe from defects in insulation of the electric light wiring. Similar conditions, no doubt, prevail in other cities.

It has been decided not to hold the International Exhibition at Brussels until 1896.

The first American vessel to pass through the Manchester Ship Canal was the "Ambrose," with a cargo of oil from Philadelphia.

The gold coinage executed at the Philadelphia mint in the fiscal year ending June 30 will, it is said, be by far the heaviest in the history of that institution, approximating \$80,000,000. The largest previous record was in 1861, when the gold coinage was \$67,588,000.

It is announced that Congress is to be urged to pass a bill providing for legitimate railroad pooling, with a view to establishing stable rates.

The war on immigrant rates from the Eastern seaboard to points west of Chicago and St. Louis is at last ended by agreement between the Western railroads.

The Hamburg-American steamship "Grimm," which arrived here on Saturday, attracted considerable attention in shipping circles, owing to the fact that she made her voyage under new steam producing arrangements. The vessel is fitted with a novel smoke consuming device, patented by a Hamburg inventor named Muller, by means of which the smoke and gases originally conveyed up the stack are drawn back and reconsumed. It is claimed that with this attachment to the vessel's furnaces she burned on her trip only 250 tons of coal instead of 350, which is her usual consumption under ordinary conditions.

According to a recent opinion rendered by Attorney-General Olney, merchandise that has been in bond for the full limit of time may be exported and brought back again as an original importation entitled to another three years in bond. This opinion traverses a recent decision of the Solicitor of the Treasury that such goods could not legally be reimported with the privileges of an original importation. In view of prospective tariff reductions, the Attorney-General's decision will have a considerable interest for the owners of some classes of goods now lying in bond which have nearly reached their limit.

Superintendent S. H. Edwards has shut down the large iron concentrator plant and mines of the Magnetic Iron Ore Company, at Benson Mines, Carthage, N. Y., and as a consequence 400 men are out of employment. The company have filled a large order received some time since and the superintendent says that the prospects for an early resumption are very poor.

The Iron Age

New York, Thursday, May 31, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - HARDWARE EDITOR.
JOHN S. KING, - - BUSINESS MANAGER.

The Annual Wage Settlement.

The Amalgamated Association have done well this year in meeting so early to formulate their desired scale of wages. More time than usual is thus given before July 1 for conferences with manufacturers. It is, of course, assumed that the latter will not immediately accept the scale presented them by the officers of the association. Manufacturers have their views as to what constitutes fair and reasonable wages as well as their workmen, and are entitled to be heard on a subject which so vitally concerns them. Rumors are current as usual that the manufacturers differ so widely from the leaders of the Amalgamated Association on this subject that a disagreement is absolutely certain, and buyers of iron and steel may expect a long shut down after the present scale expires on July 1. But these rumors are premature. Nobody knows what will be done; not even the manufacturers themselves. If some manufacturer thinks that wages should be reduced below the scale now in force, and is belligerently inclined, he may change his views should he find no encouragement among his colleagues to stand out for a settlement on that basis. Random talk should not be taken as prophecy. On the other hand, some of the Amalgamated officials have been less discreet than they should be in discussing the probabilities of a disagreement with manufacturers and a reluctant strike.

It is to be earnestly hoped that a spirit of moderation and conciliation will actuate all parties at this time in considering the question of the scale of wages for another year. This is a time when all hands should unite in endeavoring to build up the ravages made in our business structure, instead of doing all they can to continue the destructive work. Patient industry and self denial are essential to the recovery of the nation's wasted fortunes, and the application of these virtues will in time accomplish the desired result. But the patient industry must not be wholly on one side and the self denial wholly on the other. This is not to be expected. Burdens imposed by the business depression must be as evenly borne as it is possible to adjust them. For this reason neither employers nor employed can alone decide what is just and reasonable. The adjustment must be made by a conference of both interests. That conference should be conducted with perfect frankness, absolute fairness and the most earnest consideration for each other's rights.

The Duty on Barbed Wire.

Not content with placing cotton ties on the free list in violation of all consistency and justice, the Senate has allowed itself to be dragged into an even more flagrant case of attempted wild legislation by putting barbed wire on the free list. The demand was made by Populist Senators. In many respects the debate was replete with interesting incidents, but we doubt whether many of those who participated in it had any conception of the magnitude of the interests involved. We venture to state that there is no more important question now at issue in the tariff struggle than the one thus suddenly and recklessly injected into it.

The amendment which Senator Peffer of Kansas introduced for Senator Allen of Nebraska, tacked to the wire paragraph, reads: "That wires commonly used for fencing, baling and binding purposes shall be admitted free of duty." Senator Jones of Arkansas pointed out that the adoption of the amendment as framed would simply let in all wire, whereupon it was modified so as to refer only to barbed wire, the amendment as finally passed reading, "that barbed wire, commonly used for fencing, shall be admitted free of duty." A proposal made by Senator Hoar to insert "together with all material imported under such regulations as the Secretary of the Treasury may prescribe to be used in the manufacture of such wire" was promptly rejected. A proposal on the part of Senator Power of Montana to insert into the Allen amendment the words "all other fence wire" was also rejected. A disposition was manifested, however, among the leaders of the majority to bring forward at a subsequent period further amendments so drawn as to make all fence wire free.

The most serious blow ever struck at the American steel trade would be delivered if even the provision to make barbed wire alone free were adopted. The whole iron trade from the miner of Bessemer ore to the rod rolling mills and wire drawers would be affected by the loss of a very important market. By the very highest authority in this industry we are advised that the estimated annual tonnage of barbed wire is 196,000 tons. This means that in ordinary times our wire rod mills will be robbed of fully one-third of their market, the American mills having produced 627,829 gross tons of wire rods in 1892. For many years to come the surplus capacity suddenly created by the revolutionary act proposed will keep the whole wire industry, so far as its other branches are concerned, hopelessly down to the level of the fiercest competition. It means that our soft steel makers will lose an outlet for over 200,000 tons of material; that the producers of Bessemer pig will lose customers who take close upon 225,000 tons of metal, and that the miners of Bessemer ore will see their market shrink to the amount of close upon 400,000 tons annually.

Great as it is, the American steel trade cannot undergo such a wrench without its serious consequences being felt all along the line. Indirectly it will touch many keenly who may thoughtlessly have passed over the Senatorial "incident" with indifference. But the matter has even much greater significance if the contemplated amendment putting all fence wire on the free list should actually be formulated and passed.

We notice that in the course of the debate one of the Senators of the majority triumphantly called attention to the fact that there have been exports of fencing wire to the extent of 42,793,043 pounds. With that statement should be coupled the fact that until the panic dragged American prices down to their extraordinary level, the wire exported was made from foreign billets and rods. These were imported and were manufactured into wire for export under the drawback clauses. American manufacturers expanded their export trade in spite of the highly vexatious regulations with which the drawback system is hampered, and in spite of the fact that 1 per cent. of the duty paid is retained.

The steel trade should be thoroughly aroused concerning this iniquitous proposal. The placing of cotton ties on the free list, bad as it is, pales into insignificance in comparison with it.

The Retarded Coal Famine.

The striking coal miners are seriously disappointed. When they arranged for a general strike from the Alleghany Mountains to the Rockies they expected that only a week or two would exhaust coal stocks and cause such a clamor from the suffering public that the operators would hasten to resume at the rates demanded. The scarcity of coal has been severely felt in some localities, it is true, and manufacturing operations have been restricted to some extent. But thus far the inconvenience of a short supply of fuel has not been very great, when the extent of the affected territory is considered. It will be necessary to protract the strike much longer than had been anticipated if the country is to be treated to a genuine coal famine afflicting all sections of the central West. Thus far the striking miners have inflicted the worst injury, first, on themselves, and, second, on their brother workmen employed in the factories and mills now shut down for lack of fuel. The condition of general business is such that manufacturers are not overanxious to run, will not pay extravagant prices for material, and under these circumstances can close their works at any time and plead the strike clause to customers who may insist on the filling of their contracts. Coal consumers thus grow fewer and stocks last longer.

It would seem to be wise for the miners to accept advanced rates offered them in isolated districts and get to work gradually, instead of holding out

for a general settlement and taking the chances of starvation forcing many of them back to work at old rates. The manner in which the country can endure such a heavy restriction in its coal supply is a revelation. It should at the same time be a warning to the miners not to imperil their cause by insisting on too much.

The workmen's associations are now memorializing Congress to take immediate action to restrict immigration. This is a good movement. When workmen take this matter up in earnest Congress will doubtless discover some more effective way of discouraging undesirable immigration than has yet been devised. The tide continues to flow this way too strongly, notwithstanding the supposed check given to it by the depression in business here.

CORRESPONDENCE.

Swindlers in Holland.

To the Editor: The great number of inquiries we are receiving lately from American manufacturers, asking for the commercial standing of doubtful firms established in one of the Dutch commercial centers who have been sending orders—some of them of considerable importance—and who have either given no references at all or very doubtful ones, compel us to warn through *The Iron Age* anybody getting inquiries or orders from unknown firms in Holland neither to open correspondence nor send any goods to such parties. There is a gang of swindlers, having their branches all over Europe, principally residing in Amsterdam, Rotterdam and The Hague. They have been preying on the English market for a long time, until the manufacturers, after repeated warnings and considerable losses, have become more careful. These swindlers now had to look out for a new field of working, for which they chose the United States. From what we hear they have already done good business. We therefore strongly advise any reader not to send on any account goods, however small the amount may be, to doubtful parties, unless they give reliable—preferably United States—references. As we are in a position to give all information required in connection with these swindling concerns, we shall be pleased to do so to any party requiring them.

PECK & CO.
AMSTERDAM, HOLLAND, May 16, 1894.

The Cunard Steamship Company have again scored honors in the quick westward run of the "Lucania" last week. Although not beating her own best record for the run from Queenstown to Sandy Hook, she beat all records for the actual distance covered, having taken a southerly course which carried her over 96 more miles. The time was 5 days 12 hours 57 minutes. Had the "Lucania" sailed the course she took in a former record trip, the time would have been 5 days 8 hours 27 minutes at the rate of speed of her last week's voyage. The quick time made thus early in the season indicates that former transatlantic records are likely to be materially lowered this year.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., May 29, 1894.

Commodore Sampson said to the correspondent of *The Iron Age* to-day: "We have concluded our investigation of the allegations of additional irregularities in the manufacture of armor plate at the Carnegie Works. I am now engaged in preparing the report, which will require about a week or ten days. I do not assume that Mr. Carnegie personally knew anything about the irregularities, but still, he is responsible. Yes, it is very unfortunate that this has occurred. I find no circumstance which would throw the slightest suspicion upon officers of the navy. There would have been no fines levied nor premiums refunded if there had not been some grounds for such action. The effect of these irregularities at the Carnegie mills will be to give plausible grounds for obstruction in the progress of naval work, although I cannot see why. These particular contractors for armor plate are to blame, and no one else. I cannot say what action will be taken against them in the future."

The Chief of the Ordnance Bureau was not disposed to pursue the subject when it came down to the line of drawing deductions from the information which he had in matters of detail relating to these troublesome transactions. An inference drawn by your correspondent from the general tone of the conversation was that the Commodore's report will not show any additional irregularities, but will expose the methods by which the frauds were practiced. The exposure of the irregularities may have had something to do with their sudden termination.

The Commodore's report will be a very comprehensive paper, and will cover every phase of the manufacture of armor from the beginning of the contracts down to the present time. The Commodore has had a very interesting compilation prepared, including the 6489 tons of armor for the "Indiana," "Massachusetts," "Oregon," "Olympia," "Iowa" and "Brooklyn." He will also show the improvement in facilities for manufacture; that the Government has now available two armor plants, either of which is better equipped for that work than many foreign countries, and that in the future armor can be turned out quite as rapidly as Congress will be likely at any time to authorize the building of armored ships.

In speaking of the doubts raised against the Harvey process for plates of great thickness Commodore Sampson said: "I do not believe in that. The water process of course is very severe and more so on a thick than a thinner plate, but we must have more scientific data to go by than the smashing of a plate which was under suspicion before it was taken out of the group. The Department is satisfied that the Harvey process produces a more resisting armor plate than any process now known. All the armor now produced is nickel steel."

"Under the contracts of 1887 and 1890 all the armor which was not manufactured and would cause no delay was required to be Harveyized. The Bethlehem Company have eight Harvey furnaces and the Carnegie Steel Company as many more. Nickel steel plates offer great resistance, owing to the fact that the line of fire under service conditions

will be at an angle to the plate and therefore most advantageous to the plate and destructive to the projectile. At this angle the extra toughness of nickel steel is marked, as compared with ordinary steel."

In speaking of the recent experience with the Bethlehem Company side armor plate, Commodore Sampson said: "We will give that group of armor plate another test before a final decision, just as soon as the Bethlehem people send us another plate. This will perhaps be in about two weeks." The Commodore laid great stress upon the results of the test of this plate as a basis of comparison with others, but not as a final result.

OBITUARY.

JAMES H. COYNE.

James H. Coyne, publisher of *The Wagonmaker*, died on the 19th inst., at his home, Ravenswood, Ill. Mr. Coyne was born at Rock Island, Ill., about 48 years ago, and in his youth removed to Chicago, taking a position as clerk in a dry goods store on Lake street. Soon after the Chicago fire he commenced the publication of *The Western Manufacturer*, afterward *The Wagonmaker*, continuing as its publisher until the time of his death. He was one of the first Americans to take into Mexico agricultural implements and supplies, establishing warehouses in the City of Mexico in 1875.

JOSEPH HOOVEN.

Joseph Hooven, a veteran iron manufacturer of the Schuylkill Valley, died at his home in Norristown, Pa., on May 27. He was 86 years of age, and had been for some time in feeble health. Mr. Hooven, who was born in Upper Merion Township, Pa., in 1808, was entirely a self made man. Commencing life as a boy in a general store at King of Prussia, Pa., he eventually bought out the business. In 1838 he removed to Norristown, where, in 1846, he established the Norristown Iron Works, and in 1870 he erected a blast furnace near the rolling mill. He was president of the First National Bank of Norristown from 1864 until his death. In 1862 Mr. Hooven was nominated for Congress, but declined.

SYLVANUS E. PAGE.

Sylvanus E. Page, second son of Edward N. Page, one of the proprietors of the Cohoes, N. Y., Rolling Mills, and a prominent resident of Waterford, N. Y., died May 21. He was born in Pembroke, Maine, 33 years ago, and went to Cohoes with his father when a boy. He was a brother of George H. Page, superintendent of the Cohoes Rolling Mill, and of Samuel Page of the Rensselaer Polytechnic Institute, Troy, N. Y. The deceased was manager of the Cohoes Rolling Mill store.

The tests of smokeless powders now being conducted by the Naval Ordnance Bureau at Indian Head have so far proved highly satisfactory. Experiments were carried out on Saturday with a composition made at the Naval Laboratory at Newport. The firings were to ascertain the uniformity of the powder, and the results were very satisfactory. The 4 inch gun was used, and at a pressure of 15 tons a velocity of 2200 feet was attained. Under like conditions and with the same gun the velocity secured with the brown powder was never above 2000 feet.

Duluth News.

Iron ore shipments from the mines of the Vermilion and Mesaba ranges far exceed, to date, the corresponding time last year. This is, however, partly owing to the fact that the season began nearly three weeks earlier. Still the actual daily work is better than in 1893. For instance, the Duluth Missabe & Northern shipped only 80,000 tons to August last year, while it had sent out 92,000 tons up to last Saturday night of this season. The Duluth & Iron Range road had sent out 215,000 tons to the same date, or 160,000 more than to the corresponding time in 1893. In the past two weeks this road has moved over 102,000 tons, its best record for the time in any year. Shipments are also large from Ashland and Marquette.

The coal strike is, however, having a serious effect on the ore carrying and other trades. All vessels plying to the head of the lakes fuel there instead of, as is usually the case, at Lake Erie ports. They are drawing on stocks at Duluth at the rate of about 1500 tons daily. But the largest item of consumption at present is by the railways, and about 4000 tons daily are being hauled away. At first only the roads running to the head of the lakes availed themselves of this source of supply, but now every road running into the Northwest from Chicago, the Milwaukee, Northwestern, Kansas City, Burlington, Wisconsin Central, not to mention the Union Pacific and the network of lines toward the Southwest controlled by the Great Northern, are all using coal from docks at the head of Lake Superior. At the opening of navigation there were 375,000 tons of bituminous coal on dock at Duluth and Superior, nearly all unsold, while to day there is scarcely a pound of the 100,000 tons yet remaining that is not sold to either vessel lines or railways. Ten days more of the coal strike will see nearly all lake craft tied up for want of coal. The Minnesota Steamship Company, hauling a large share of the ore of the Duluth & Iron Range road, have coal enough to last to June 15, but the majority are in no such condition.

At present only six mines in Minnesota are being operated, the Chandler and Minnesota on the Vermilion range, each shipping about 3000 tons daily; the Canton, Oliver, Mountain Iron and Franklin on the Mesaba, sending out from 4000 to 1000 tons a day respectively. The Hale, Pioneer, Lake Superior and perhaps the big Biwabik are booked to start in June. Some ore sales are being made by the Rockefeller interests at old figures, and the inquiry for ore is said to be improved. The Rockefeller Company, who are now paying \$1 and better per day to their men, have arranged a scheme for better pay, based on an excess of product per man over the average.

A new group of what appears to be large and valuable mines has been opened on the Mesaba to the south of the group about Virginia. In this group, besides the Adams, which was mentioned in this journal some time ago, are four properties on which exploratory work has been carried on during the winter and spring. One of these is the McInnis, where ten pits have been sunk from 20 to 50 feet in an ore that assays as high as 65.50 iron and 0.021 phosphorus. The land lies on a hillside, can be easily worked, has a surface of 40 feet and is owned in fee by a Chicago timber owner who leases at 35 cents

royalty. A second belongs to the Roucheleau-Ray Company of this city in fee. Diamond drill holes have explored a large ore body and a working shaft is now sinking. A third is the St. Clair, where 12 pits are in ore from 50 to 75 feet. Two large working shafts are being sunk. The fourth is the Helmer, where ore was first found in a moose runway last fall. All these are in a radius of a mile and all are probably one large deposit. None of these properties as yet have railway connection and will not have in all probability this year.

PERSONAL.

J. F. Wilcox of Pittsburgh has returned from Europe.

Francis H. Saylor of Pottstown, Pa., president of Cofrode & Saylor, Incorporated, owners of the Philadelphia Bridge Works, sailed last week for Europe for a few weeks' rest and recreation.

From an official report lately made to the State Department by the United States Consul at Batoum it is gathered that the Russian petroleum trade increased largely in 1893. The production of crude petroleum reached the daily average of 136,000 barrels from about 316 wells, against less than 112,000 barrels per day from 298 wells in 1892. The average per well was 430 barrels in 1893, compared with 374 barrels in 1892. The output of all products from Baku in the first 11 months of 1893 was 1,304,000,000 gallons, against 1,063,500,000 gallons in 1892, being an increase of 240,500,000 gallons, of which about 128,000,000 gallons was residuum, which is largely used as fuel. The exports also show a substantial increase over those of 1892. Owing to the excessive production prices declined materially, and in order to restore the business to a more profitable basis an effort was made to unite the various interests under the protection of the Government, but this plan, so far as known, has not yet been successfully accomplished.

In a report on the trade of Stockholm and the eastern coast of Sweden during last year, M. S. Constable, the British Consul, remarks that 1893 was an unfavorable year for the Swedish iron industry, the export of nearly every description of iron and steel goods, with the exception of pig iron, showing a decrease. Pig iron was shipped to a larger extent than was the case during the preceding year, but the prices obtained were not good. The outlook in the market, however, is now better in consequence of the resolution adopted by the Swedish Ironmasters' Association in the beginning of last year to diminish the output of Swedish pig iron by 10 per cent. This resolution has been acted on, with the result that stocks are reduced and prices now fairly maintained.

The blast furnace of the Dunbar Furnace Company, Dunbar, Pa., was banked on May 12 for about four days for want of coke. In the meantime the ovens of this concern in the Connellsville region were going ahead as fully as the force of diggers secured would allow, and as soon as enough coke was made to

justify it, the furnace was started again. Since the above date there have been several stoppages of about a day each for the same reason, but at this time the furnace is in blast and likely to continue so.

Making a Cellar Water Proof.

A cellar can be so constructed as to be water proof, says a writer in one of our exchanges, if the bottom or the floor is first covered with cement, the walls built thereon laid in cement and the exterior of the walls covered with cement. This makes practically a water tight basin. The cement used must be the best Portland cement, one part; clean sharp sand, one part. After a cellar is built it is not so easy to make it water proof. Still it can be done. Cover the exterior of the wall with the above cement, ditto the bottom, and work the cement in under the bottom of the wall. If these directions are followed you will succeed. But if cheap materials are used and the work badly done, you will be sure to fail. A drain put around the outside of the wall, or even inside, below the cellar floor, may be efficient in carrying off the water if you can give it a good delivery.

Expansion of Girders.

A writer on strains in girders, referring to the amount of movement of iron girders due to expansion and contraction under extreme variations of temperature, observes that for iron and steel the coefficient or rate of expansion is nearly 1 inch for 100° F. of heat for every 100 feet in length. Thus a girder 60 feet in length will expand $\frac{6}{100}$ inch for 100° increase of temperature and contract the same amount for 100° decrease of temperature; or a girder 75 feet long will vary $\frac{75}{100}$ inch or $\frac{3}{4}$ inch, for a variation of 100°. He says: "In order to provide for all contingencies it is the general practice to allow for a vibration of 100° F., or a movement equal to $1\frac{1}{2}$ inches for every 100 feet in length." A girder 60 feet long will therefore require to have an allowance for movement in the moving end equal to $\frac{6}{100}$ inch or 1 inch, the other end being fixed. It is only necessary to put the rollers under one end of the girder, so that the movement of the girder may be at that end only.

The triple screw cruiser "Minneapolis," sister to the "Columbia," is now ready for trial, and will undergo a preliminary run about the middle of next week. Her builders, the Cramps, have notified the Navy Department that the vessel will be ready for her official acceptance trial early in July, and they expect to deliver her for commission in August.

The Rio Tinto Copper Company of Aberavon, Wales, one of the largest copper corporations in the world, are transferring the greater part of their works from South Wales to Rio Tinto, near Huelva, Spain, where the company's mines are situated. The company have determined to have most of the rough copper smelting done at Rio Tinto, employing native Spanish labor.

The last of the Crane furnaces, at Gatasauqua, Pa., has blown out.

Chinese Shops and Dwellings.

The general design of the native house, however humble, is a modification of the more ornate temple or *yamen* (i. e., official residence and office). There is the same catenary curve in the roof, with more or less ornamentation at the gables. A sober drab will replace the gaudy glazed yellow or green roof tiles, and varnished or plain wood the brilliant paint work of the more public edifice. But the elevation will still suggest the same general design. Stone is almost unknown as a house building material except for foundations. Bricks, sifted earth and matting or thatch for the walls, brick tiles for the roof and wood for interior fittings are the ordinary materials used. Houses are sometimes constructed of wood alone, but are not common. No private house is allowed to equal in height the temples in its vicinity, nor be ornamented in the same manner: nor may yellow—the imperial color—be used about the building. Cellars and basements are absolutely unknown. Two-storied houses are infrequent. We summarize from Dr. Wells Williams' well-known work the most important details as to Chinese house building.

The *Ni Chuan*, or sifted earth, is a compound of sifted gravel and lime mixed with water and sometimes a little oil or varnish, of which durable walls are made by pounding it into a solid mass between planks secured at the sides and elevated as the wall rises, or by beating it into large blocks and laying them like bricks in a wall. When stuccoed and protected from the rain, this material gradually hardens. In houses of the better sort the stone work of the foundation rises 3 feet or 4 feet above the ground, and is laid with great regularity and solidity. Between the stone work and the lower brick course an anti-damp layer of fine cut straw is introduced and this appears to be very effective. The fronts of the dwelling houses present no opening except the door, and when the outer walls of the several houses join those of gardens and inclosures the street presents an uninteresting sameness, unrelieved by steps, windows or porticoes. The walls are 25 to 30 feet high, usually hollow, or so thin as to be unable to support the roof unaided, nor are the builders very particular about their perfect uprightness. The bricks are the same size as our own and burned to a grayish slate color, although red bricks are sometimes seen. They are made by hand and cost from \$3 to \$8 per thousand. Lime is obtained from shells, and it does not appear that it is ever derived from limestone.

WALLS.

The walls are often stuccoed but not painted, and the bricks are occasionally rubbed smooth with stones and the interstices pointed with fine cement. In place of a broad cornice the top of the wall is frequently relieved by a molded ornament in burnt clay representing a battle, landscape, cluster of flowers or some other design, defended from the weather by the greatly projecting eave. A black painted band, relieved by corners and designs of flowers and scrolls, is a common and cheap substitute for the carved figures. Chimneys are almost unknown. The smoke from kitchens is allowed to escape through a latticed roof, while open fires are never burned. The charcoal stove is generally used, but in the north the sleeping rooms are fitted with kang or brick bed places kept warm by a fire beneath. A hole in the wall acts as a chimney, but numerous deaths from charcoal suffocation take place every year.

ROOF SUPPORTS.

In order to support the roof the purlins and ridge poles consist of strong timber extending from wall to wall, and the rafters of slender strips, on which the tiles are upheld. In hipped roofs the principal weight rests on pillars, with a series of king and queen posts intervening, by which every part is equably supported; but curb roofs are not made, as attics are as unknown as cellars.

The pillars are of red or varnished wood without base or capital, of disproportionate shape, and frequently ornamented with carvings or inscriptions, or concealed by scrolls. In the rare cases of the two-story houses, or where it is impracticable to support the roof in this way, the rooms are contracted and the cross walls built up to the plate, each room being covered with its own roof. The pillars are occasionally arranged so as to form side passages to the rear rooms, the intercolumniations being screened or built up. A slight ceiling usually conceals the tiling, but the apartments appear lofty, owing to the elevation of the roofs.

ARRANGEMENT.

The general arrangement of a Chinese dwelling of the better class, standing in its own grounds, is that of a series of rooms of different dimensions, separated and lighted by intervening courts and accessible along a covered corridor communicating with each, or by side passages leading through the courts. In the former case the corridor opens out upon a garden. In towns, where the houses are of one story and the lots irregular in their shape, there is more diversity in the arrangement and size of the rooms. In the country establishments of the wealthy families it is customary to provide for the increase of members by marriage, &c., by adding additional courts and buildings.

We have already noted that "private" houses are not allowed to overtop any neighboring temples. An exception to this rule is made in the case of pawnbrokers, who are permitted to build square towers of four or five stories, the goods received being stored on the upper floors as a better protection against thieves. In nearly all disturbances the pawnbrokers' shops are the first to be attacked and, if possible, looted by the mob. The doorways are defended by stout posts; their lower ends dropping into mortise holes cut in the stone threshold and locked by an ingenious arrangement above.

Glass is unknown for windows in the interior, and in place of it oyster shells are employed (*Placund'placenta*), being scarcely inferior to ground glass in transparency.

BUILDING METHODS.

The process of building strikes the European spectator as somewhat curious. The first thing is to raise a complete bamboo scaffolding, which supports a mat roof and thus insures immunity from rain or sun to the workmen. The peculiar value of the bamboo when subjected to a perpendicular strain only is well known. The lengths are tied together with rattan and the scaffolding thus made is as strong and useful as the more elaborate construction of poles and rope used in Western countries. The next proceeding is to put in the uprights, and these once in place and sufficiently braced, the roof is at once proceeded with. The walls are, therefore, built up to the roof. One of the most valuable materials known to the native builder is *chunam*. It consists simply of lime and earth (or fine sand and gravel) thoroughly incorporated with sufficient water and then beaten

to a level with a hand maul of special shape. This is the universal substitute for plank flooring and its adoption by our own builders would in many cases be beneficial. It is easy to mix and work, and hardens quickly and satisfactorily.

The tools and other adjuncts used by the Chinese bricklayer or mason resemble our own, differing only in shape and size. The hod is replaced by the basket. The average wages of a workman are 20 cents per day.

It should be noted that underground house drains are unknown in China: All offensive matter is removed every morning by men who are not paid, but pay for the contribution to the manure heap thus obtained, which they dispose of at fair rates to gardeners and cultivators.

The comparative immunity from epidemic disease enjoyed by the Chinese generally is probably due to this system of removing what would otherwise pass into cesspools and drains. One other point is worth passing notice. The architect, like the painter or author, however distinguished in his own line, neither claims nor receives any special recognition in consequence. Scarcely a single name has been handed down to an admiring posterity, while at the present day the most ingenious builder fails to secure even passing honor.

Hard Wood.

A recent issue of the *Timberman* contains the following legal decision in regard to what constitutes "hard wood." A certain man had a contract with a railroad company to deliver "hard" cord wood and he delivered poplar in part fulfillment of the contract. The railroad company objected, but the contractor won his case in court in consequence of the judge's decision that botanically any tree that had a leaf as distinguished from a needle was a hard wood, regardless of what the actual texture of its fiber might be. This is, as far as we know, along a new line, but it is strictly in accord with other decisions based upon the technical and commercial nomenclature of the wood. There may be no particular reason for saying that Lombardy poplar, or basswood, or cottonwood is a hard wood, but such it is commercially, as decided by the courts, and those dealing in timber may as well understand it. If this new decision, based upon botanical considerations, is sustained it will merely add strength to the old position.

British agricultural statistics, just issued, show that the wheat area in Great Britain fell off 342,724 acres in 1893 as compared with 1892, while the product showed a decrease of 9,862,398 bushels. The yield per acre was 0.4 bushel less in 1893 than in 1892 and 3.16 less than the average for a number of years.

A railroad which the Germans have built in Asia Minor, extending from Ismid, a harbor about 60 miles east of Constantinople, to Angora, is remarkable as having less wood in it than, perhaps, any line in the world. Not only the rails and bridges, says our authority, but the ties and telegraph poles are of iron, nine-tenths of it furnished by German works, and chiefly by Krupp. There are no less than 1200 bridges on the line, one measuring 590 feet, one 458, one 445 and three 327 feet. There are 16 tunnels, the longest measuring 1430 feet.

MANUFACTURING.

Iron and Steel.

The fourth suit was commenced against the Maumee Rolling Mill Company, at Toledo, Ohio, on the 22d inst. The plaintiffs are O. A. Bostwick, Alvin Peter, James Secor and John Berdan, and they asked the court for the appointment of a receiver to take charge of the rolling mill for the benefit of the creditors. The petition relates that the capital stock of the company is \$500,000, divided into 500 shares of \$1000 each. The plaintiffs claim to own 50 shares, and they say that the works for more than a year have been shut down and that the company have not been carrying on the business for which they are organized. They allege that the bonded indebtedness of the company is \$132,000, and that there is another indebtedness of \$85,000, with a large amount of interest accumulated on both. The three other suits against the company were commenced by Thos. Walbridge, two, and the Second National Bank, one.

The Lebanon Iron Company, at Lebanon, Pa., have commenced the erection of a new 9-inch mill.

The rolling mills at Londonderry, Nova Scotia, will probably be opened soon. The furnaces have been put in operation, and quite recently the pipe plant was opened.

The New Haven Rolling Mill, New Haven, Conn., has resumed work with half force after an idleness of three weeks.

The American Steel Casting Company, who have lately purchased several of the leading steel foundries of the country and are conducting them under one management, are now putting in the Ridgway balanced steam hydraulic crane.

The Isabella Furnace Company of Pittsburgh, operating the three Isabella furnaces at Etna, Pa., have been running two stacks at about one-half their regular output on account of the coke strike, and hope to keep them running at this rate at least until the strike is settled.

Howe, Brown & Co. of Pittsburgh, manufacturers of cast steel of all descriptions, have been operating their plant as usual, and up to the present time have felt no ill effects from the coal and coke strikes, other than their fuel costs considerably more than formerly.

Part of the plant of the Republic Iron Works, at Pittsburgh, is closed on account of labor troubles, but that portion now in operation is using natural gas for fuel, and has consequently not been affected by the coal strike.

The two blast furnaces of Shoenberger & Co. of the Juniata Iron & Steel Works, at Pittsburgh, have been closed for about two weeks owing to inability to procure coke on account of the strike. The mills of this firm were also closed about a week ago on account of the coal strike and at this writing are still idle.

The New York, Lake Erie & Western Railroad Company have recently issued a circular announcing the addition of the following to articles of iron and steel manufacture, and which therefore will take the same rates: Rolling colters or rolling colter blades in packages, L. C. L.; rolling colters or roller colter blades, C. L.; harrow disks in packages, L. C. L.; harrow disks, C. L.; stove castings in boxes or barrels; wedges in boxes or casks; lasts, N. O. S., in boxes, barrels or casks. Special iron rates will not apply on the above named articles to points in Trunk Line territory.

On May 21 eight puddling furnaces, the rolling mill and cut nail factory of the Norton Iron Works, Incorporated, Ashland, Ky., resumed operations. The blast furnace of this concern is banked on account of the coke strike.

Last week the Edgar Thomson Steel Works, at Bessemer, Pa., were closed down in all departments on account of lack of Bessemer pig iron. Seven of the nine furnaces at Bessemer are also banked, there being but two stacks now in operation, one of these running on Bessemer and the other on spiegel.

Moorhead, Brother & Co., Incorporated, Pittsburgh, operating the Vesuvius Iron & Nail Works, at Sharpsburg, Pa., manufacturers of skelp iron, are operating their plant, having had no trouble thus far in securing a plentiful supply of coal.

The plant of the Hubbard Co-operative Iron Company, at Hubbard, Ohio, manu-

facturers of muck iron, is closed down in all departments on account of the coal strike.

The difficulty between the Union Iron & Steel Company of Youngstown, Ohio, and their puddlers over the question of wages to be paid for working swarth iron has been amicably adjusted.

The Kittanning Iron & Steel Company, Kittanning, Pa., have been granted a charter of incorporation, with a capital of \$350,000. The directors are Jas. Mosgrove, John A. Colwell, Kittanning, and Chas. T. Neale of Pittsburgh.

In two weeks recently No. 1 turn in the 32-inch mill at the Homestead Steel Works turned out 3080 tons of steel, while No. 2 turn turned out 2830 tons, which is the largest output in this mill during any two weeks since the first of the year.

On the 23d inst. the workmen of blast furnace No. 7 of the Illinois Steel Company, at South Chicago, hoisted a broom to celebrate its enormous output of 432 gross tons of pig metal in 24 hours. The company are putting one of their blast furnaces at the North Carolina Rolling Mills, on the North Branch, in readiness to go into operation as soon as the coke strike is over. They have considerable ore on hand.

Negotiations have at last been concluded for the location of the Kansas City Steel & Iron Works at Argentine, Kan. They will occupy a building erected some years ago for the manufacture of radiators but not used. The new company will fit it up at once and will put a force of 50 men at work as soon as the plant can be put in operation. They will manufacture car couplings of a new design and other appliances. To get the company located the citizens offered some substantial assistance and have taken part of the stock of the company. This is one of the most important transfers made in the city during the present year and the citizens of Argentine are delighted with it.

The fires were drawn from 12 double furnaces at the Burden Iron Works mills, Troy, N. Y., last week on account of the short supply of soft coal. Operations in the finishing departments were not in any way interfered with by this, but on Monday of this week several additional furnaces were taken from the working list also on account of the lack of coal. The Burden Iron Company will, however, continue operations until the regular closing time in July and will fill all orders.

The puddling department of the York Rolling Mill, at York, Pa., has closed down on account of scarcity of coal.

The Excelsior charcoal furnace, at Ishpeming, is to be started again.

Machinery.

The Carondelet Foundry Company of St. Louis, Mo., manufacturers of gray iron castings, find the demand for their castings even in these times of universal depression fully up to their capacity, and are making improvements in their plant to increase their facilities. They have just adopted the Ridgway steam-hydraulic crane, made by Ridgway & Son, Coatesville, Pa.

The National Water Tube Boiler Company of New Brunswick, N. J., held their annual meeting at the main office on May 16. While the financial depression checked the output of the summer months, later and recent business nearly reached that of similar months in preceding years. A cash dividend of 5 per cent. on the \$100,000 capital stock was declared out of the profits, leaving still a surplus for future contingencies.

The Harrison Safety Boiler Works of Philadelphia are getting ready to build a new foundry. Their present foundry being designed merely for their own supply, they have not been able to do much outside work. They, however, have decided to place themselves in a position to supply others. The cranes, which have already been ordered, will be the Ridgway balanced steam-hydraulic.

The Fisher-Leaf Company's foundry at Louisville, Ky., has been destroyed by fire, entailing a loss estimated at \$10,000. The foundry was a three-story brick structure, and only the stock room was saved from loss.

The Millholland Tube Company, organized a short time since, are operating their plant at Reading, Pa., on full time and with a full force. The company are said to be well supplied with orders.

Application has been made to the court by the directors of the Davids Machine

Works of 129 Worth street, New York, for a voluntary dissolution of the corporation. It was incorporated on March 5, 1890, with a capital stock of \$60,000, of which \$54,000 was paid in, and succeeded to the business of Charles H. Davis, which was the manufacture of experimental machinery, models and expert work. The concern has been operated at a loss ever since it was organized, and over \$50,000, it is said, was invested in the business. There was a bond issue of \$10,000 secured by a chattel mortgage on the plant, but the mortgage has been satisfied and the tangible assets sold to Lewis H. Bullard in satisfaction of claims against the company of \$40,000. The other liabilities are about \$5,000; assets, \$1680 in book accounts. The principal stockholders are Lewis H. Bullard and John W. Weed of Flushing, W. H. Humphrey of Norfolk, Conn., and H. H. Perrin of St. Joseph, Mo. W. H. Humphrey was president.

Receiver J. A. Van Winkle of the defunct Riverside Bridge & Iron Works, Paterson, N. J., has reported to the Chancellor that the liabilities of the concern are \$96,000 and the assets \$14,344.

Orr & Sembover of Reading, Pa., steam engine manufacturers, are building a new foundry to make their own castings, which formerly have been purchased outside. They expect to be ready to start some time in June. The cranes which have been ordered are made by Messrs. Ridgway & Son of Coatesville, Pa.

Mackintosh, Hemphill & Co. of Pittsburgh recently shipped to the Duquesne Steel Works, Duquesne, Pa., the new engine to drive the new blooming mill built by them and which will soon be installed at Duquesne. This new mill is 38-inch, with engine 42 x 60, and replaces a 32 inch mill with engine 28 x 43. The new mill will probably be shipped and erected early next month, and when in operation the Duquesne Steel Works will have a capacity for turning out from 1200 to 1600 tons of billets every 24 hours. The daily average production is not expected to go below 1400 tons.

Owing to the coal strike, the Daniels Steel Railroad Tie Company, Youngstown, Ohio, have notified their customers that they will be unable to fill orders until the strike is ended.

It has been decided to concentrate at Akron, Ohio, the drop forging department of the plant of the Whitman & Barnes Mfg. Company, now located at Canton, Ohio, and Geo. A. Barnes, manager of the Canton establishment, will remove to Akron. At the new Akron shops enlarged facilities will be provided for the manufacture of diamond twist drills. This latter department has come to be an important factor in the business of the concern. The manufacture of mower and reaper knives, long carried on at Akron, will be transferred to the extensive works of the company recently located at West Pullman, Ill. These changes will be made during the coming summer. The plant at Akron to be vacated by the Whitman & Barnes Mfg. Company will probably be occupied by an Eastern concern with whom negotiations are now being conducted.

The Novelty Iron Works have been incorporated at Clinton, Iowa, with a capital stock of \$25,000, to operate a foundry and machine shop. William Taylor is president, John Taylor vice-president and L. O. Taylor secretary and treasurer. Work has begun on the erection of a building for this purpose on sidings of the Northwestern and St. Paul railroads, where special facilities will be enjoyed for handling heavy machinery.

Announcement is made that the Beloit Iron Works Company of Beloit, Wis., have lengthened their working day to ten hours and increased their working force at the same time. They have steady employment for a full force for at least three months. Statements of this kind form cheerful reading and cannot become too numerous.

The Waterous Engine Works Company, whose plant was recently burned at South Park, Minn., have leased a shop of the South Park Bridge & Bolt Works and will resume manufacturing operations. They have purchased a new equipment of tools and machinery.

The organization of the Corliss Steam Engine Company of Providence, R. I., and the purchase of the plant and all the patents of the late George H. Corliss has been announced. The new company are chartered with a capital of \$1,000,000. The entire plant possesses facilities which are unexceptionable and which testify to the genius and mechanical skill of its founder. It is the

purpose of the management to continue the business upon the former lines. They will build the Corliss engine in all of the different styles, i. e. condensing, non-condensing, single or in pairs, compound and triple expansion, in sizes from 50 to 3000 horsepower, all embodying the latest improvements of Mr. Corliss. Also the Corliss patent vertical tubular water leg boilers, which are of especial value in the present practice of compound and triple expansion engines, where high pressures are necessary and dry superheated steam becomes a factor of more than former importance. A feature of great importance is the facility for doing repair work. Patterns are in stock representing all of the product of the works since 1849, with the drawings and records. The works have a capacity for the employment of over 1000 men. The directors are S. Holman, Worcester, Mass., treasurer Holyoke Machine Company, Holyoke and Worcester; Gen. Wm. F. Draper, Hopedale, Mass., treasurer Hopedale Machine Company; Wm. H. Bent, Taunton, Mass., treasurer Mason Machine Works; Stephen A. Jenks, Central Falls, R. I., treasurer Fales & Jenks Machine Company, Pawtucket, R. I.; Haven C. Perham, Lowell, Mass., treasurer Kitson Machine Company; P. W. French, Boston, Mass., New England sales manager National Tube Works; David M. Thompson, M. E., Providence, R. I., past 12 years general manager B. B. & R. Knight's Mills; George R. Babbitt, Providence, R. I., president American Oil Company and formerly superintendent Wm. A. Harris Steam Engine Company; Charles E. Giles, Providence, R. I., formerly with Corliss Steam Engine Company as superintendent and agent. The company will be managed by the following officers: D. M. Thompson, president and treasurer; Stephen A. Jenks, vice-president; William B. Sherman, secretary; Charles E. Giles, agent; L. H. Wattles, superintendent.

Benjamin C. Smith, 275 Pearl street, New York, who introduced the French pipe cutting machine 18 months ago, for cutting off sections of water mains and smaller sizes of pipe, reports a very satisfactory business in this tool. In addition to having been adopted by a number of water companies in America, orders have been received from Christiania, Norway; Santos, Brazil; Bombay, India, Mexico, &c. This implement, described at length in these columns at the time of its introduction, makes a clean cut on wrought or cast iron pipe in a few minutes with two men, saving the remaining portion of the pipe, heretofore ruined in smashing out, not to mention the avoidance of leaks often started 100 or 200 feet away from shock.

Dietz, Schumacher & Co., Cincinnati, Ohio, have just received an order from the Lodge & Shipley Machine Tool Company of the same city for one of their 128-inch drill presses, the largest size made by them. The demand from outside for their Universal drill presses and engine lathes has been very satisfactory to date.

A number of the creditors of the Swamscott Machine Company, at South Newmarket, N. Y., have petitioned the Supreme Court for the removal of the receivers and for an order to place the company in insolvency, so that the property can be sold to pay the claims against it. The receivers claim that it is for the interest of the company to continue as at present. If the petition is refused the creditors will ask for an order to compel the receivers to pay their claims. The court has ordered a hearing at Concord on June 5.

Hedrick Brothers of Pettitt, Ind., will erect a machine shop at South Florida.

The foundry of B. P. Blanton & Co. of Griffin, Ga., has been burnt.

Taylor Brothers of Clinton, Iowa, are building a new machine shop.

The Carpenter Lathe & Tool Company will build a larger plant at St. Johnsbury, Vt.

The strike at the Standard Foundry, Cleveland, Ohio, has been settled.

Hardware.

Russell Jennings Mfg. Company, Deep River, Conn., deny the report which has been given some circulation that the factory would close down on June 1, characterizing it as utterly false. They call attention to the fact that they did not shut down during the recent depression nor discharge any men nor reduce wages, and state that their sales during the past three months have exceeded their production by more than 600 dozen auger bits.

Cleveland Twist Drill Company, Cleveland, Ohio, have recently received a letter from a practical man in the employ of one of the largest railroads in the country in which some complimentary remarks are made concerning the quality of their twist drills. The writer refers to having drilled two holes in a 66-pound steel rail with two men in exactly four minutes, the drills having been used in one of the well-known makes of track drills which are run by hand power. He also states that the company's drills have very often drilled 100 holes without being sharpened, mention being made of one instance where 120 holes by accurate count were drilled without sharpening the drill. The company refer to business as not as brisk as it was about two months ago, which they attribute mostly to the scarcity of coal and the shutting down of very many of the manufacturing establishments.

The Eclipse Bicycle Company, Beaver Falls, Pa., manufacturers of high grade bicycles, have commenced to reduce their force of workmen for the reason that the bicycle season is gradually drawing to a close. This concern have been running to full capacity since November of last year, and much of the time their plant has been operated until 9 o'clock in the evening, while part of the time a double force of men was employed, a portion of them working all night and the balance all day. The concern reports a very satisfactory business for the year, having built over 6000 bicycles since January, and they are very much gratified at the way this branch of business has held up, as compared with other industries.

Anthony & Cushman Tack Company, Taunton, Mass., who are now running their works six days a week, advise us that they are giving particular attention to the manufacture of carpet, upholsterers' and Swedes tacks.

Efforts are being made to establish a plant at Youngstown, Ohio, for the manufacture of bicycles. Negotiations have been pending for some time, and it is stated the outlook for a successful conclusion is promising.

C. B. Pauls is still manufacturing hand cut files, for those who prefer this kind of tool, at 467 Keap street, Brooklyn. This industry years ago, before the advent of the machine cut file, supplied a trade extending from Maine to California, and at one time employed 100 hands. The business was begun by S. D. Willmott, and by him carried on from 1847 to 1860, when he died. C. B. Pauls, long in his employ, started in 1863 for himself at the same stand, and is yet manufacturing files for those who insist on the hand cut method.

Clement & Dunbar of Beach street, Philadelphia, have this season shipped ice cream freezers to Great Britain, France, Germany, New Zealand and other foreign points. They report that they have also done a very satisfactory business in ice breakers.

The Union Braided Cord Mfg. Company have been organized at Portland, Maine, for the purpose of making machines for the manufacture of braids and cords. The capital stock of the company is \$100,000. The officers are Edward A. Phenister, president, and D. K. Phenister, treasurer.

The American Axe & Tool Company, at Ballston Spa, N. Y., are rebuilding their forges and will discontinue the use of Lima oil, the price of oil having been advanced. Coal can now be used at a considerable saving for the company, besides permitting the men to turn out better work.

D. C. Hancock & Co. of Valley Mills, N. Y., are intending to manufacture steel traps at Utica. They expect to employ 50 hands.

Niagara Silver Company, Niagara Falls, N. Y., have for several months been established in their new factory, which is referred to as fully equipped with the most approved modern machinery and a full force of skilled workmen. The company are accordingly prepared to fill orders promptly for sterling silver souvenir spoons, and also the various grades of plated and unplated spoons, forks, &c., the quality of which is guaranteed.

The Burns Saw Works of Toronto have opened a branch factory in Montreal in the building formerly occupied by the Montreal Saw Works.

Miscellaneous.

The Electrical Association, Incorporated, of Waterbury, Conn., have placed the contract for their new power station with the Berlin Iron Bridge Company of East Ber-

lin, Conn. The building will be 66 feet in width and 133 feet in length, the side walls of brick and the roof covered with the Berlin Iron Bridge Company's anti-condensation corrugated iron roof covering.

The Star Bolt & Tube Company of Pittsburgh, with a capital stock of \$200,000, have been incorporated under the laws of West Virginia. The new concern propose to engage in the manufacture and sale of bolts, nuts, washers, &c., the incorporators being J. C. Jamison, Pittsburgh; Henry Monath, Jr., and S. Barrick, Homestead, Pa.

A meeting of the stockholders of the Kepp Gear Wheel & Foundry Company, Allegheny, Pa., will be held on Thursday, June 21, for the purpose of voting for or against an increased indebtedness of the company.

The Addyston Pipe & Steel Company of Addyston, Ohio, near Cincinnati, are erecting new machine shops for their works. The Lodge & Davis Machine Tool Company of Cincinnati, Ohio, have secured an order for four large lathes to be used in the above shops.

The employees of the Pittsburgh Glass Company, at Ford City, Tarentum and Creighton, Pa., have been notified that their wages will be increased on June 1. The notice states that the president has been instructed to increase the wages of all the employees of that concern to an amount equal to one-half the reduction made on January 1.

Russell & Markham of Portland, Conn., are building an addition to the trolley wheel works.

The Elmira, N. Y., Bridge Works are now running day and night and are employing 150 men on the two shifts. This is 55 more than were employed during the winter dull period. At that time there was a 10 per cent. reduction in wages. The largest number ever employed at the works is 180. The machinery in the lay out shop has been augmented by the addition of a planer made by the Pond Tool Company of Plainfield, N. J.

The Armstrong Boring Tool.

A boring and threading tool having a wide application has been placed on the market by the Armstrong Bros. Tool Company of 78 Edgewood avenue, Chicago. The bar carrying the cutter is held in a drop forged steel holder adapted to be held in the ordinary tool post. The holder is L shaped, one arm being held in the tool post and the other arm being formed as a split hub to receive the bar, which, by reason of the right angle shape of the holder, can be extended past the tool post. The bar can be adjusted to any desired length to suit depth of hole, and can be clamped by the binding screw that closes the split hub. The end of the bar is provided with two different forms of caps, one to hold the cutter at right angles with the bar, and the other holding it at an angle of 45°. The end of the bar is threaded to receive a cup which is slotted to hold the cutter, which, when the cap is screwed up, is held securely against a hardened steel pin in the end of the bar. The device is especially adapted for the economical use of self hardening steel cutters.

The Cleveland, Cincinnati, Chicago & St. Louis Railroad Company have recently placed orders for the iron bridges which they will erect on that system during the present year. Eighteen bridge companies competed for the work and the prices ranged as follows: For deck plate girders f.o.b. cars, from 1.90 to 2.40 cents per pound. The railroad company are to do the erection work. For through plate girders, from 1.96 to 2.40 cents per pound f.o.b. cars. The railroad company are to erect them. For pin connected through truss bridges, 2.70 to 3.63 cents per pound, erected by the bridge company. The Union Bridge Company of Buffalo, N. Y., were the lowest bidders and received the award.

The Iron and Metal Trades.

The scarcity of Coal and Coke is having an increasing effect upon the production of Iron and Steel. Practically the manufacture of Pig Iron in the territory between the Alleghany Mountains and the Chicago district is suspended, and in their efforts to continue running the Steel mills have cleaned up the stock of Bessemer Pig. In the Eastern markets all stray lots, with the exception of a few aggregating less than 10,000 tons, have been bought up, and in the West a 2000-ton lot on the head of the lakes has been shipped to Pittsburgh. In that whole territory and practically in the East the stocks of the large Steel companies have been depleted. These are never reported, but we know of instances in which six months ago individual concerns carried 40,000 and 50,000 tons.

The course of prices in the Pittsburgh market shows that buyers are convinced that Bessemer Pig will not relapse to its lowest point. In fact, our Pittsburgh correspondent records sales of 30,000 tons for June, July and August delivery at \$11 @ \$11.15 at valley furnaces, a clear advance over the lowest point before the strike of \$1.50 per ton.

For spot Billets there is some demand, but the supply is practically exhausted in the Pittsburgh and adjacent districts. In the Chicago district the advance to \$19.50 has checked business. In Eastern Pennsylvania a round sale was made by a Rail mill to an adjacent Wire mill.

The scarcity of soft Coal is beginning to tell on the mills east of the Alleghany Mountains, and together with the floods has caused considerable temporary suspension.

While thus the supply has been very materially curtailed the demand has improved very little. Buyers, except for small lots for immediate delivery, continue extremely indifferent. They regard what advance there has been as merely temporary. In this they may prove mistaken, so far as the whole line of Steel products is concerned. It looks as though the prices would not come within \$1.50 @ \$2 of the lowest point reached before the pending trouble.

Quite a little boom in prices has been worked up over the Italian demand for Old Rails which has been shrouded in so much mystery. Two vessels have been chartered, involving from 2000 to 4500 tons. Under the stimulus of inquiries holders have now worked up their ideas on prices to the point that any further business cannot be done unless the Italian market goes up quite considerably.

Chicago.

(By Telegraph.)

Office of The Iron Age, 59 Dearborn street, CHICAGO, May 29, 1894.

The Iron market in general is working up to a higher plane of values. The labor troubles appear to have less effect on consumption than on production, while freight rates are advancing all around. It is expected that by June 15 all cut rates will be restored to the old schedules or close to them.

Pig Iron.—Local Coke Iron has been in excellent demand, with total sales for the week aggregating about 6000 tons. Very heavy shipments are now being made from local furnaces, one company reporting shipments for the week as the largest in their history. Prices are very firm, makers refusing to give concessions from current rates, which are as stated in our quotations. Agents of Southern furnace companies report only a moderate business, yet they are receiving a great many inquiries, which are small but more plentiful of late. Some of the Southern companies are completely out of the market and others are out of some grades. Silvery Iron is not to be had and Soft Irons are getting very scarce. Tennessee Charcoal is not available for immediate shipment. Lake Superior Charcoal is quiet. The foundries in this vicinity seem to be able to get enough Coke to keep in operation and less fear is experienced of a Coke famine than some two weeks ago. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$15.00 @	\$15.50
Local Coke Foundry, No. 1....	11.25 @	11.50
Local Coke Foundry, No. 2....	10.50 @	11.00
Local Coke Foundry, No. 3....	10.00 @	10.50
Local Scotch.....	11.50 @	11.75
Ohio Strong Softeners No. 1....	12.60 @	13.50
Southern Silvery, No. 1.....	..... @	.....
Southern Silvery, No. 2.....	..... @	.....
Southern Coke, No. 2.....	10.00 @	10.35
Southern Coke, No. 3.....	9.75 @	10.00
Southern, No. 1 Soft.....	10.25 @	10.50
Southern, No. 2 Soft.....	10.00 @	10.25
Tennessee Charcoal, No. 1....	..... @	.....
Tennessee Charcoal, No. 2....	..... @	.....
Alabama Car Wheel.....	17.50 @	18.00
Jackson County Silvery.....	15.00 @	16.00
Coke Bessemer.....	12.00 @	.....
Other Ohio Silvery.....	12.50 @	13.00

Bars.—Bar Iron is the only article in the Iron list which is not keyed up to the condition reported last week. For some reason it is inclined to droop, probably because the demand has fallen off to some extent; making competition for business a little keener. Common Iron, mill shipment, is quoted at 1.05¢ @ 1.15¢, Chicago. Soft Steel Bars on the contrary are firmer with the strength of Billets and 1.30¢, Chicago, now appears to be the minimum on mill shipments.

Structural Material.—Nothing new is reported, but prices are firm with an upward tendency. Quotations on mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.45¢; Tees, 1.60¢; Angles, 1.40¢; Universal Plates, 1.45¢. Small lots from stock sell at 1.70¢ @ 1.85¢ for Beams, 1.50¢ @ 1.60¢ for Angles, and 1.70¢ @ 1.80¢ for Tees.

Plates.—Only moderate business is being transacted, but prices are very firm. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.45¢ @ 1.50¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 2.50¢ @ 5¢. Dealers are disposed to be stiff. They are not inclined to take any large amount of business, but are carrying the small trade. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.80¢ @ 1.90¢; Tank Steel, 1.60¢ @ 1.85¢; Flange Steel, 2.10¢ @ 2.35¢; Boiler Tubes, 75 % off. The most important event of the week in this line

is the sale by Park, Brother & Co. of the entire stock of Plates in their warehouse here to Joseph T. Ryerson & Son. It is Park, Brother & Co.'s intention to permanently discontinue the sale of Plates from stock and confine themselves to selling for shipment from mill.

Sheets.—There is less doing in Black Sheets. Buyers have by no means covered their wants, but they are not inclined to pay the advances asked, even if they may be obliged to pay considerably more later in the season when the demand comes from consumers. Mill shipments of No. 27 Common Stove Pipe Iron, Chicago delivery, are firm at 2.40¢ @ 2.45¢, while on Soft Steel Sheets the minimum is 2.50¢. Galvanized Iron is stronger, with buyers urging prompt shipment on contracts. Prices show an upward tendency, with some manufacturers now quoting 75 and 10 % off on mill shipments, but the market has not yet quite come up to this rate. Sheet Copper is still quoted to large buyers at 14¢ with no discount.

Merchant Steel.—Manufacturers report an improved carload trade. Some have declined to enter season contracts at present prices. We quote mill shipments, Chicago delivery: Smooth Finished Machinery and Tire, 1.70¢ @ 1.80¢; Open Hearth Spring Steel, 1.85¢ @ 1.90¢; Bessemer Machinery, 1.55¢ @ 1.60¢; Bessemer Tire, 1.40¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

Billets and Rods.—The last advance on Billets has to some extent checked the buying movement, but inquiries are being steadily received, and it is only a question of time until sales are made at full figures, if the present condition continues. Quotations are \$19.50 @ \$20. A 1000-ton sale of Wire Rods is reported to go East, while smaller quantities have been sold to local consumers. They are firm at \$25.25 @ \$25.50.

Rails and Track Supplies.—Orders for standard Rails are steadily being received, but they seldom call for large lots. Quite numerous contracts are being entered for 1000-ton lots, but most of the sales are for smaller quantities. The local mill is very full of work for the immediate future, and occasionally there is some difficulty about making delivery in the time named in the contracts. Quotations are continued at \$25 @ \$27 for standard Steel Rails; 1.35¢ @ 1.40¢ for Steel Splice Bars; 2.15¢ @ 2.25¢ for Track Bolts, with Hexagon Nuts; 1.65¢ @ 1.70¢ for Spikes, and 1.60¢ for Links and Pins.

Old Rails and Car Wheels.—Negotiations are on foot for the sale of considerable quantities of Old Iron Rails, but thus far no particulars have transpired. Nominal quotations are still \$10, Chicago. Old Steel Rails are quiet, with prices ranging from \$6.50 for short pieces to \$9.50 @ \$10 for long lengths. No sales of Old Car Wheels have been reported for some time, but quotations are nominally continued at \$10 @ \$10.50.

Scrap.—It is difficult to learn of any transaction in Old Material of this character. Some of the near by mills are said to be buying, but their purchases are by no means heavy. Dealers quote the following selling prices per net ton: Railroad Forge, \$9; Dealers' Forge, \$8 @ \$8.50; No. 1 Mill, \$6.50; Pipes and Flues, \$6; Heavy Cast, \$7 @ \$7.50; Stove Plate, \$5 @ \$5.50; Fish

Plates, \$10; Horseshoes, \$9; Mixed Steel, gross ton, \$5.

Metals.—Carload lots of Lake Copper are quoted at 10¢, and casting brands at 9½¢ @ 9¼¢. Spelter has sold to some extent at 3.25¢, but producers are not inclined to make contracts for future shipment at this price. Pig Lead is held at 3.20¢ but is extremely dull.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., May 28, 1894.

The events of the past week have not been favorable to the Iron trade, the fuel shortage having been aggravated by the floods, temporarily stopping work at mills which otherwise might have been run for some time longer. Fuel is being rapidly exhausted, and unless relief comes within the next couple of weeks it is doubtful if more than two or three mills within a radius of 100 miles will be able to do anything at all. Prices have been worked up to comparatively high figures for quick deliveries, but the supply is so small that it cuts no great figure, especially with so many offerings to accept business at concessions for deliveries "ex strike." The conclusion is inevitable that the actual situation is very little better than it was two or three months ago. The demand is being fairly met, even though a large proportion of the mills and furnaces have been compelled to suspend operations for want of fuel. The inference is unavoidable that with the regular output the supply would have been excessive and prices much less favorable than they are to-day. The advance in freights and ores, and probably in fuel, will no doubt prevent a return to the low figures ruling earlier in the year, but it is to be regretted that there are as yet no distinct indications of any decided increase in the volume of business.

Pig Iron.—Some holders claim to be getting better prices than have been quoted during the past two or three weeks, and in view of the increased cost of ores, fuel and freights, they look for still better prices in the near future. The market is badly mixed, however, and all sorts of quotations are given, especially for foundry grades. A good deal depends on quality and a good deal on the desire to sell, and between the two a variation of 50 cents per ton and upward is frequently met with. The usual quotation for No. 2 X is \$11.50 @ \$11.75, but sales at \$11.25 are not infrequent, but as we said before all depends on circumstances, and considering everything the chances are in favor of higher rather than lower prices. Buyers are very indifferent, however, and very few are disposed to contract far ahead even at the extremely low figures now ruling, although frequent requests for options have been made within the past day or two. Low grade Iron is wanted at \$10 @ \$10.25, delivered, but there is very little to be had at less than \$10.50, some being held at a still higher figure. Bessemer is pretty well cleaned up, and as there is nothing to sell, it is hardly possible to give a quotation, although \$13 @ \$13.50 might be paid for quick delivery and \$12 @ \$12.50 for July and later. General quotations for Philadelphia or equivalent points are about as follows:

Bessemer, spot.	\$13.50 @ \$14.00
Bessemer, July, August and September.	12.00 @ 12.50
Standard No. 1 Foundry X.	12.50 @ 12.75
Standard No. 2 Foundry X.	11.50 @ 11.75

No. 2 Plain.	10.75 @ 11.00
No. 1 Soft.	11.50 @ 11.75
No. 2 Soft.	10.75 @ 11.00
Standard Gray Forge.	10.50 @ 10.75
Ordinary.	10.25 @ 10.50

Steel Billets.—There is some inquiry for Billets, but at prices asked buyers are not willing to place orders. Nominal quotations for delivery not later than the middle of June are \$19.50 @ \$19.70, but in anticipation of an early settlement of the Coal strike and larger supplies of Billets, buyers expect to shade \$19, and perhaps still better as soon as the mills get in full working order. A sale of several thousand tons is understood to have been made by the Bethlehem Iron Company to the Iowa Barb Wire Company of Allentown, but the price is not given, although supposed to be considerably less than the current asking price.

Finished Material.—The difficulty of securing quotations for early deliveries has been considerably increased during the past week, and those who could make them have realized very satisfactory prices. Several mills were short of Coal, others were flooded out, and only two or three were able to keep their machinery in motion, so that they have had almost a monopoly on that class of work. Tank and Bridge Plate has sold at 1.35¢ @ 1.40¢, and in some cases still higher figures have been mentioned for lots that were imperatively needed. With a settlement of the Coal strike, however, the supply of Steel will be largely increased, and as the demand is not large prices will doubtless react somewhat from the special figures above quoted. There is nothing in sight to encourage the expectation of any great activity, as large orders are still conspicuously absent and only the small trade can be relied upon as steady buyers. There is some bidding on structural work, which may furnish several thousand tons of orders in course of a few days, but the facilities for production are so great that orders of that kind have very little influence unless backed up by business from other sources. General quotations are about as follows, delivered:

Grooved Skelp, delivered.	1.20¢ @ 1.25¢
Standard Refined Bars.	1.30¢ @ 1.40¢
Medium quality.	1.20¢ @ 1.25¢
Tank Steel.	1.30¢ @ 1.40¢
Heavy Plates.	1.30¢ @ 1.40¢
Shell.	1.50¢ @ 1.60¢
Flange.	1.60¢ @ 1.80¢
Angles.	1.30¢ @ 1.40¢
Beams and Channels.	1.40¢ @ 1.60¢

Old Material.—There is no business of any amount, so that prices are almost nominal. Mills are doing so little that they are not buying, and in many cases have ordered shipments to be stopped until Coal can be had. Asking prices are about as follows:

Heavy Melting Steel.	\$10.00 @ \$11.00
Light Melting Steel.	8.00 @ 9.00
No. 1 Wrought Scrap.	10.00 @ 11.00
Machinery Cast.	9.50 @ 10.00
Wrought Turnings.	8.00 @ 8.50
Cast Borings.	6.00 @ 6.50
Old Iron Rails.	12.00 @ 12.50

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, May 29, 1894.

The general undertone of the market for Pig Iron has been strong all the week and especially has Soft Iron been wanted and sold at better prices. The sales were mainly in jobbing lots and of foundry grades, No. 2 being most in demand, and No. 2 Soft coming full up to No. 2. Regular because of its

scarcity. We hear of some sales to the Iron Pipe works in the South running into the thousands of tons, but here no large lots have been sold or offered. The scarcity of Coal restricts production and trade, yet it is known that some of the furnaces in the South are able to obtain Coal enough to turn out Iron to the extent of their current demand. It is contemplated by the Northern railroads to advance freight rates the middle of June and this has a demoralizing effect upon the market, as all uncertainties do have, but it would be difficult to buy much Iron to be shipped before that time. There have been only small sales of Southern Charcoal Iron. There is no quotable change in prices, no one expecting to obtain an advance, but could obtain more for Soft Iron if they had any to offer. Quotations are unchanged, but are scarcely more than nominal, as follows:

Foundry.

Southern Coke, No. 1.	\$10.25 @ \$10.50
Southern Coke, No. 2.	9.25 @ 9.50
Southern Coke, No. 3.	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1.	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2.	14.00 @ 14.50
Lake Superior Coke, No. 1.	12.50 @ 13.00
Lake Superior Coke, No. 2.	11.50 @ 12.00
Hanging Rock Charcoal, No. 1.	17.00 @ 17.50
Hanging Rock Charcoal, No. 2.	16.50 @ 17.00
Tennessee Charcoal, No. 1.	13.00 @ 13.50
Tennessee Charcoal, No. 2.	12.00 @ 12.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable.	16.25 @ 16.75

Forge.

Gray Forge.	8.50 @ 8.75
Mottled Coke.	8.25 @ 8.50

Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, May 29, 1894.

The visit of Governor Pattison of Pennsylvania to Houtzdale, Pa., on Saturday, the 26th inst., and his address to the striking miners at that place may possibly lead to an effort for a settlement of the Coal strike by arbitration. Others say his visit had no significance and nothing can come of it. It is the impression that this week will prove to be a vital one in the great struggle now going on, and action will be taken one way or the other to end the trouble. The Connellsville Coke operators made fair progress last week in the direction of starting their idle ovens, but did not make as much headway as they expected. However, if the same gains can be recorded this week it is believed the Coke struggle will soon be settled. The demand for prompt Bessemer Iron and Billets is about over, and the supply of both is nearly exhausted. In Finished Material, for prompt shipment, there has been a general advance in prices all along the line. Mills that are in position to make prompt shipments have no trouble in getting from \$2 to \$4 per ton advance over prices ruling one month ago.

Pig Iron.—During the week the Troy Steel & Iron Company sold 10,000 tons of Bessemer Pig, and it was immediately resold to the Carnegie interest. The same concern have bought about 2000 tons of Bessemer from the West Duluth Furnace Company, at Duluth. The Iron was brought to Cleveland by water and thence taken by rail to Bessemer. At this writing seven of the nine furnaces at Bessemer are banked. There is very little inquiry for prompt Bessemer, owing to the curtailment of operations among the finishing mills. There have been some sales of Bessemer Pig for June, July and

August delivery at \$11.15 at Valley furnace, equal to \$11.60 @ \$11.75 Pittsburgh. Some 30,000 tons have been closed and other lots are under negotiation. These sales indicate that some buyers believe that the recent low prices in the Valley, ranging from \$9.50 to \$9.75, will not be touched again. A review of the Pig Iron market as it exists to-day shows there are the best grounds for this belief. In the first place there are no stocks of Bessemer, either in the Valleys or in Pittsburgh, but, on the contrary, most of the furnaces have considerable Iron sold which they have yet to make. In the second place a number of stacks in the Pittsburgh, Valley and Wheeling districts have been blown out for repairs, and will not make any Iron for the next three or four months. Again, the Wheeling and Pittsburgh Steel mills have used up their stocks, and as none of them make enough Iron to take care of their converting capacity they will be compelled to buy considerable Iron right along. In addition to this, it is the custom of the Soft Steel people to keep stocks of Iron on hand ranging anywhere from 5000 to 15,000 tons to meet any contingencies that may arise. When these features of the market have been considered it can be readily seen that the demand for Bessemer Pig should be heavy for some time, and it seems certain that Iron at \$11.60 @ \$11.75, Pittsburgh, is a good purchase. It would not be surprising to see the market stay close to \$12 for the balance of this year. The stocks of Foundry and Gray Forge, both here and in the Valleys, are very light, and when the demand increases, as it must when the mills get in good running order again, it is not improbable that higher prices will prevail. Outside of a few unimportant transactions in Foundry and off grades of Bessemer there have been no sales for close delivery during the week. The following prices are asked for spot deliveries:

Neutral Gray Forge.....	\$9.50 @	\$9.60, cash.
All-Ore Mill.....	9.50 @	9.75
No. 1 Foundry.....	11.10 @	11.25
No. 2 Foundry.....	10.50 @	10.75
No. 3 Foundry.....	9.75 @	10.00
Bessemer.....	13.00 @	13.50

Ferromanganese.—We note a sale of 25 tons domestic for June delivery at \$53, delivered.

Billets.—The Duquesne mill will go off this week, and during the shut-down the new 38 inch blooming mill will be installed and other improvements made. When these have been completed the Duquesne plant is expected to turn out an average of 1400 tons of Billets per day. The Wheeling mills are all off on account of the Coal strike and scarcity of Bessemer Pig. Billets for prompt delivery have sold up to \$19 @ \$19.25 for small lots. A buyer who wanted 1000 tons for spot delivery was unable to do better than \$19 at maker's mill. A local mill is reported as quoting \$19 for Rod Billets for the last half of the year. It is needless to add that the offer was not accepted. However, it is not believed that Steel will again touch this year the extremely low prices ruling during the first quarter.

Sheets.—Trade in Sheets is very active and mills are unable to guarantee prompt shipment of Soft Steel Sheets. Prices are from \$4 to \$6 per ton higher for deliveries up to July 1, and a number of mills are out of the market, having sold up all they can make to that date. We quote Common Iron as follows: No. 24, 2.15¢; No. 26,

2.25¢; No. 27, 2.35¢. For Soft Steel an advance of \$2 per ton on above prices is asked. Galvanized Iron is higher, and it is difficult to get prompt deliveries. We quote at 75 and 10 % for prompt delivery.

Plates.—The market shows no new features. Prices are firm, some mills refusing to go below 1.20¢ for Tank Plate, while others regard 1.25¢ as their minimum. We quote as follows: Tank Steel, 1.20¢ @ 1.30¢; Flange, 1.40¢ @ 1.50¢; Shell, 1.40¢; Marine, 1.60¢ @ 1.70¢; Fire Box, 1.75¢ @ 4¢, as to quality.

Bars.—Three of the Valley mills are closed on account of the Coal strike, while others are not able to secure enough fuel to work to full capacity. Buyers are trying to hurry up shipments before the advance in freights goes into effect, but the mills are in such condition that they can give little aid in this direction. For prompt shipments an advance of fully \$2 is asked on Common Iron Bars as may be in stock, and for large lots makers are declining to quote. We quote Common Iron Bars at 1.10¢ @ 1.20¢ half extras. Steel Bars for prompt delivery are up about \$2 per ton and mills are quoting 1.25¢ @ 1.30¢ with Bar Iron extras.

Structural Material.—Makers are declining to quote except for prompt acceptance, and prices are firm and may go higher. The demand is for small lots only, but the two local mills are full of orders and are declining to shade 1.25¢ at mill for Beams and Channels. We quote as follows: Beams and Channels up to 15 inches, 1.25¢ @ 1.35¢; Angles and Universal Plates, 1.25¢ @ 1.35¢; Tees, 1.35¢ @ 1.40¢.

Muck Bars.—We make nominal quotation of \$18.25 @ \$18.50, delivered.

Merchant Steel.—Some mills are asking considerable advance over former quotations, especially for Bessemer grades. Mills are also refusing to guarantee shipments, owing to the difficulty of getting Coal and the consequent uncertainty of operations. The general demand is only fair. We have reduced quotations on Cold Drawn Steel Shafting and quote as follows: Bessemer Machinery, 1.30¢ @ 1.35¢; Open Hearth Machinery, 1.50¢ @ 1.60¢; Open Hearth Spring, 1.70¢ @ 1.75¢; Toe Calk, 1.80¢ @ 1.85¢; Machine Straightened Tire, standard quality, 1.60¢ @ 1.65¢; Cold Drawn Steel Shafting, 2.50¢ base; Tool Steel, 5¢ @ 7¢ for ordinary grades.

Skelp Iron and Steel.—There is a scarcity of Iron and Steel Skelp for prompt shipment, several of the mills having closed and prices are from \$2 to \$3 per ton higher in consequence. We revise quotations and now quote Skelp for prompt delivery as follows: Steel Skelp, 1.15¢ @ 1.20¢; Sheared Steel Skelp, 1.25¢ @ 1.30¢; Grooved Iron Skelp, 1.30¢ @ 1.35¢; Sheared Iron Skelp, 1.40¢ @ 1.45¢.

Pipes and Tubes.—The Philadelphia Natural Gas Company have placed an order for 5 miles of 20 inch Line Pipe, the contract price being about \$70,000. An advance of from 5 % to 10 % over former quotations is now being asked on some sizes. The strike at the National Tube Works Company has not been arranged. The report of labor troubles at the plant of the Duquesne Tube Works Company is untrue.

Wire Rods.—We are not advised of any sales, mills generally refusing to quote on account of the uncertainty of

operations. The Rod mill of the Pittsburgh Wire Company has been closed for lack of Coal, but is expected to start up before this week is out. A sale of 300 tons at \$26, delivered at buyer's mill, is reported.

Wire Nails.—A meeting of Wire Nail manufacturers was held here recently at which the following concerns were represented: New Castle Wire Nail Company, Salem Wire Nail Company, Consolidated Steel & Wire Company, HP Nail Company, American Wire Nail Company and Oliver & Roberts Wire Company, Limited. It was agreed to fix the price of Wire Nails at \$1.10 base, in carload lots, to take effect immediately. One prominent mill was not represented, but it is stated that satisfactory arrangements have been made by which the co operation of this interest will be secured. A fair number of orders have been placed at the advanced price, one concern being credited with buying 6000 kegs. Makers of Cut Nails are not disposed to book contracts, as the continuance of the Coal strike for another week will close most of the mills. We quote Cut Nails at 95¢ @ \$1 in carload lots for the usual averages.

Barb Wire.—Considering the lateness of the season the demand is excellent, and makers are insisting that higher prices must soon rule on account of the Coal strike and the jump in the price of Billets. We quote Four-Point Galvanized at \$2.10 @ \$2.15, Pittsburgh, and Painted at \$1.75 @ \$1.80. Plain Wire is ruling at \$1.40 in carload lots.

Connellsville Coke.—Considerable progress was made last week by the Coke operators in the starting up of the idle ovens in the Connellsville region. Appearances now indicate that the strike will be broken before long and the men return to work at the old rates. The methods successfully pursued in the great struggle of three years ago have been used, and already several of the most prominent works in the region are in fair running order. It is the impression that just as soon as some additional plants are started and the men realize the fight is against them they will return to work.

St. Louis.

(By Telegraph.)

Office of The Iron Age,
Bank of Commerce Building,
St. Louis, May 29, 1894.

Pig Iron.—The cut in Western freight rates which is withdrawn today has had a beneficial effect on the market. A number of heavy sales have been made which were made possible by the reduced rate. Prices are firm and a continuance of the Coal strike will cause additional strength. Shipments are being delayed by the inability of consumers to secure Coal and Coke, and without these they have no immediate use for Iron. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$11.00 @	\$11.25
Southern Coke, No. 2 Foundry.....	10.00 @	10.25
Southern Coke, No. 3 Foundry.....	9.75 @	10.00
Southern Coke Wheel.....	17.00 @	18.00
Lake Superior Car Wheel.....	16.25 @	16.50
Ohio Softeners.....	14.25 @	14.50

Bar Iron.—The demand for Bar Iron continues to improve and prices are firmly maintained. Car builders are busy and railroads are also ordering more freely. Mills quote 1.10¢ @

1.15¢ and are not able to fill large orders even at this advanced price. Jobbers ask 1.30¢.

Barb Wire.—Notwithstanding the lateness of the season a fair trade is reported by the mills and prices are firmer. Painted is quoted at 1.85¢ for carload lots. Galvanized commands the usual 40¢ per hundredweight additional. Jobbers are busy and have advanced their prices to correspond with the advance made by the mills.

Wire Nails.—The recent advance to \$1.20 for carload lots is being well maintained. Trade is heavy and there appears to be no good reason why the advance cannot be maintained.

Rails and Track Supplies.—An increased trade in Track Supplies is noted. Requisitions from the railroads show a decided increase in volume, and with the increased demand is coupled a firmer feeling regarding prices. We quote as follows: Splice Bars, 1.30¢ @ 1.35¢; Spikes, 1.70¢ @ 1.75¢; Bolts, Square Nuts, 2¢ @ 2.05¢; with Hexagon Nuts, 2.10¢ @ 2.15¢; Steel Links and Pins, 1.60¢ @ 1.65¢; Iron, 1.75¢; Old Rails are quoted at \$10, while Steel Rails are \$26 @ \$27.

Pig Lead.—This metal is beginning to show some strength. Sales amounting to 400 tons were made to-day at 3.12½¢ with 200 tons additional at 3.15¢. At the latter price the market is firm, and a general improvement both in volume of business and prices is anticipated.

Spelter.—At 3.20¢ this metal is lifeless. There is a strong tone to the market, however, and as there is no surplus stock on the market an early improvement in price is more than likely.

Financial.

The continuance of the coal strike and of tariff uncertainty, with their attendant embarrassments to business, appear to be the dominating influences bearing upon the financial and mercantile situation at present. Contrary to expectations the strikes of miners and coke workers do not yet show many signs of breaking up. The scarcity of fuel resulting therefrom is being severely felt in many quarters. It has already caused immense losses through the closing down of mills and factories, and a prolongation of this condition must necessarily result in still more serious consequences to the trade of the country. Combined with the want of confidence engendered by uncertainty in regard to tariff legislation which continues to prevail in the minds of the business community, these unfortunate strikes have naturally caused a marked setback in the reviving activity which was noticed a few weeks ago. Nevertheless the actual volume of trade induced by the absolute necessities of consumption and slender stocks of all kinds of goods is reported as fairly large. Under more favorable circumstances the volume of trade would undoubtedly be extraordinarily heavy, and were the tariff question and the labor troubles out of the way the outlook would be very bright for an active and profitable trade movement. As it is, the prices of products still tend downward and no buying of goods is done beyond that which actual needs dictate.

Extraordinary efforts will, it is asserted, be made to press the tariff bill through Congress so that it may become law and go into effect by July 1.

Could this be assured it would without doubt afford a much needed relief, both to general business and to the Treasury. The condition of the Treasury gold reserve, owing to the continued drain of gold exports and the shrinkage in revenue receipts, is beginning to excite uneasiness. The gold reserve stands now at less than \$79,000,000, and there is no means of increasing it, even if the gold export movement ceases. Customs receipts are not expected to increase until the new tariff takes effect, and of these but a very small proportion are paid in gold. Meanwhile nearly all of the metal that has been sent abroad of late has come from the Treasury. The shipments last week amounted to \$4,475,000. Of this only \$900,000 was sent by Saturday's steamers, a much smaller sum than was generally anticipated. In addition, \$1,000,000 was shipped on Tuesday of this week. Some well informed bankers assert that the movement has now reached its declining point and that no more heavy shipments will be made. This opinion is based on the assumption that all the big national loans abroad have been placed and the Continental banks require less gold than heretofore; that money is very easy in London; and that foreigners are showing an increased disposition to purchase American securities. Moreover, the balance of trade in our favor is large and increasing. All these factors tend to prove that the efflux of gold is likely to be succeeded before long by a return flow of the metal to this country.

One fact that gives evidence of some revival of trade activity throughout the country is pointed out by the *Financial Chronicle*, namely, that the Clearing House returns for the latter half of May show improvement as compared with the first half of the month and with the months preceding. For the four months ending April 30, 1894, the aggregate clearings were less by 31% for the entire country and by 37% at New York alone than for the same period of last year. For April the decrease was 25% for the whole country and 28% at New York. For the first half of May the comparison was rather worse than better; the decrease for the week ending May 5 being 33% for the United States and 40% at New York, and for the week ending May 12 30% for the whole country and 38% for New York. The week ending May 19 showed a reduction of 25% for the whole country and 29% at New York, while the returns for last week indicate a reduction of only 15% for the whole country and 16% at New York as compared with the corresponding week last year. The returns of business failures in the United States for last week also exhibit a gratifying diminution both in number and in the aggregate of liabilities.

Railroad earnings do not show any improvement, nor can they be expected to do so at this time, as compared with last year, with its increase of business caused by World's Fair traffic. The *Chronicle* reports the gross earnings of 69 roads for the second week of May at \$5,230,539, a decrease of \$1,156,465, or 18.10%, and gross earnings of 25 roads for the third week in May at \$2,905,037, a decrease of \$618,301, or 17.55%. The April statement of the Pennsylvania system, just published, is an instructive illustration of the general depression in railroad earnings. It runs as follows: All lines east of Pittsburgh and Erie, for April, 1894, as compared with the same month in 1893, show a decrease in gross earnings of \$1,131,-

476.27, a decrease in expenses of \$888,193.66, and a decrease in net earnings of \$298,282.61. The four months of 1894, as compared with the same period of 1893, show a decrease in gross earnings of \$4,203,189.99, a decrease in expenses of \$3,793,071.21, and a decrease in net earnings of \$410,068.78. All lines west of Pittsburgh and Erie, for April, 1894, as compared with the same month in 1893, show a decrease in gross earnings of \$742,016.57, a decrease in expenses of \$438,565.07, and a decrease in net earnings of \$303,451.50. The four months of 1894, as compared with the same period of 1893, show a decrease in gross earnings of \$2,381,404.84, a decrease in expenses of \$2,021,983.98, and a decrease in net earnings of \$359,420.86. The settlement of differences in regard to rates by the railroads and the restoration this week of uniform freight rates has been received with satisfaction.

Saturday's bank statement showed a decrease in the surplus reserve of \$1,400,000, leaving the amount now standing above legal requirements at \$76,800,000. Loans contracted \$233,200—an unfavorable sign—and deposits decreased nearly \$41,000,000 during the week. The loan market has failed to show any substantial improvement, although long loans are somewhat more difficult to negotiate at the current low rates. Call loans on stock collateral rule at 1%, business in these loans representing chiefly bankers' unemployed balances. The amount of time money offering is still large, while the needs of borrowers are comparatively small. The ruling rates are 1 @ 1½% for 30 and 60 days, 2% for 90 days, 2½% for four months and 3% for longer terms; but offerings for long dates, as up to the end of the year, were smaller. Mercantile paper is in excellent demand by both in and out of town institutions, and there is a lively competition for all the first-class material placed on the market. The offering is, however, limited. Rates are 2½% for the highest class of indorsements, 2½% @ 3% for choice 60 to 90 day receivables, 3% @ 3½% for commission house names with four months to run, and 3½% @ 4% for prime and 4½% @ 6% for good long time single names.

The week in the Stock Exchange has been barren of any special interest. Business has been dull and restricted to professional trading, while prices show no very marked change. London buying has become more pronounced during the week under review, and has encouraged the recovery of a stronger feeling in some of the railroad stocks, particularly in St. Paul and others of the granger group. The market closed dull and strong on Saturday, and during the opening days of the current week has shown but little life, probably due in a measure to the intervention of a holiday. The following list shows the extreme fluctuations of the more active stocks since May 24, together with closing prices on May 29:

	High- est.	Low- est.	Closing May 29.
Am. Sugar Ref.....	104½	98½	100½
Atchison, T. & S. Fé....	9½	8	8½
Chicago Gas.....	72½	68½	73½
Chic., B. & Q.....	78½	76½	77½
Chic., Mil. & St. Paul....	60½	57½	59½
Chic., Rock Isl. & Pac..	69½	67½	68½
Distilling & Cattle Fdg..	24½	23½	24
Gen. Electric.....	36½	33½	35
Lake Shore.....	133	130½	132
Louisville & Nashville...	46½	44½	45½
Manhattan.....	119½	117	117½
Missouri Pacific.....	27½	25½	27½
National Lead, Common.	38½	36½	38½
New York Central.....	99	95½	97½
Northern Pacific, Pfd....	15½	14	14½
St. Paul & Omaha.....	37	35½	36½
Western Union.....	84½	82½	83½

Railway and miscellaneous bonds have been irregular and somewhat dull. Prices are fairly well maintained and have experienced a material advance in some favorite investment issues, which are becoming scarce. Government bonds have been quiet, with little change in price, except that the 4's are a shade lower. The following were the closing quotations on Tuesday:

	Bid.	Asked.
2's, 1891, registered.....	96	.....
4's, registered.....	113 $\frac{1}{2}$	113 $\frac{3}{4}$
4's, coupon.....	113 $\frac{1}{2}$	114 $\frac{1}{2}$
5's, registered.....	117 $\frac{1}{2}$	118
5's, coupon.....	117 $\frac{1}{2}$	118

Sterling exchange has eased a trifle during the week on purchases of stock for foreign account. The supply of commercial bills is small and the demand from remitters active, otherwise the rates would drop below the point at which gold can be exported with profit. Actual business was done on Tuesday at \$4.87 $\frac{1}{2}$ for 60 days, \$4.88 $\frac{1}{2}$ for demand, \$4.89 for cables and \$4.86 $\frac{1}{2}$ for commercial. Domestic exchange on New York is quoted as follows: New Orleans, commercial 100 premium, bank 150 premium; Charleston, buying par, selling $\frac{1}{4}$ premium; San Francisco, sight 10, telegraph 15 premium; Savannah, buying par, selling $\frac{1}{4}$ premium; Chicago, 70 premium.

Metal Market.

Pig Tin.—With rather better London prices, appropriate adjustment of quotations here and some missionary work of intended speculative character, the market has been made to look firmer. Business has not increased, however, and the demand has been very ordinary. What remains in the way of support is conjectural. The records show, however, that official prices have been moved up to 19.95¢ @ 20¢, net cash, for round lots, and that a trifle above has been paid for ordinary jobbing quantities. The volume of business, speculative and otherwise, has, however, been comparatively small.

Copper.—Business has been slow, and what there was of it passed at practically the same prices that have ruled for some time past. There is little change in the character of demand from either export or home trade buyers. The offering is not particularly heavy, but sufficient to keep prices rather easy. The range is now about 9.30¢ @ 9.50¢ for Lake Superior Ingot, 9 @ 9 $\frac{1}{2}$ ¢ for Electrolytic, and 8 $\frac{1}{2}$ ¢ @ 9¢ for ordinary Casting.

Pig Lead.—Sales have been moderate and the demand has not changed perceptibly, being influenced very little by the results of the tariff maneuvers. For the present prime desilverized Lead is not on the market at less than 3.35¢, although soft Missouri, the spot supply of which seems to be enough to be annoying, has been offered at as low as 3.30¢, for delivery during June. Only a few hundred tons have been sold here during the week, but Western business is understood to have increased, and St. Louis sales alone are estimated at least 500 tons for Eastern account.

Spelter.—There is a somewhat stronger tone to the market, not because of livelier buying in this section or vicinity, but on purchases made at primary points of stock for shipment elsewhere. The fact resultant is that 3.45¢ @ 3.50¢ have become very close prices for ordinary brands, delivered at Eastern points.

Antimony.—Only routine business has been done, but enough of it to keep the market quite steady. Present prices are about 10¢ @ 10 $\frac{1}{2}$ ¢ for Cookson's, 8 $\frac{1}{2}$ ¢ @ 8 $\frac{3}{4}$ ¢ for Hallett's, 9 $\frac{1}{2}$ ¢ for L X and correspondingly for other grades.

Nickel.—Aside from ordinary purchases there is little movement, and prices, while varying somewhat widely according to size of lot, show no radical change. About 45¢ @ 50¢ will cover the range.

Tin Plate.—Business has been somewhat uneven, but the aggregate makes a fair showing, and from all accounts compares very favorably with that of the preceding week. Prices have undergone little change, but it seems very difficult to buy futures at prices that were commonly quoted less than a week ago.

New York.

Office of *The Iron Age*, 96-102 Beade street, }
New York, May 29, 1894.

Pig Iron.—For Foundry Iron the demand is light, and in spite of the coal miners' troubles, prices remain unchanged. It is possible that some of the Eastern Pennsylvania furnaces will go from Foundry to Bessemer Pig. We quote standard brands \$12.50 @ \$13 for No. 1; \$11.25 @ \$12 for No. 2, at tidewater. Southern Iron, same delivery, \$11.50 @ \$12.25 for No. 1; \$10.50 @ \$11 for No. 2; \$10 @ \$10.25 for No. 3; \$10.25 @ \$10.75 for No. 2 Soft, and \$10.50 @ \$11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9.75 @ \$10.25; Bessemer Pig, prompt delivery, \$12 @ \$12.50, at furnace.

Cast Iron Pipe.—There is talk of an advance of \$1 per ton on Cast Iron Pipe. Among the recent sales is one lot of 1000 tons for Dolgeville, N. Y., at \$22.50, delivered, by a Southern works; 600 tons for Newport, Maine, and 300 tons for Woodbury, Conn., by the Aniston Pipe & Foundry Company.

Ferromanganese.—The demand for foreign is light. We quote \$52 @ \$52.50 for small lots. A curious state of affairs is reported as existing in the Ferro market in Europe. English Ferro is being shipped to Germany and German Ferro goes to England.

Steel Rails.—There is nothing doing. Quotations remain \$24.80, tidewater, for Standard sections; \$22 @ \$24, tidewater, for Light Sections, and \$21 @ \$24, at mill, for Girder Rails.

Track Material.—We quote as follows for small lots: Spikes, 1.50¢ @ 1.70¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

Billets and Rods.—The market is quiet and nominally is \$19 @ \$19.50 for Domestic. In Foreign some business has been done in very Soft Open Hearth Stock. In Domestic Rods we note a sale of 500 tons at \$25, Western mill, to the Pacific coast. A lot of about 1000 tons of Foreign Rods in a banker's hands at a Puget Sound port has sold to a Wire mill at \$19, ex-duty. Foreign Rods are offered at £5. 2/6, c.i.f., Montreal.

Manufactured Iron and Steel.—During the week a local firm of Architectural Iron works have taken the University Building contract, involving about 1500 tons of Beams and the work for the Wolfe Building, a 12 story structure. Among the other work re-

cently secured by the same concern is the Meinhard warehouse and the Sailors' Snug Harbor warehouse on Ninth street and Fourth avenue. Prices for immediate delivery are higher, but the volume of business is not large. We quote: Beams up to 15-inch, 1.35¢ @ 1.50¢ for round lots; Angles, 1.25¢ @ 1.35¢; Universal Mill Plates, 1.25¢ @ 1.35¢; Tees, 1.50¢ @ 1.60¢; Channels, 1.35¢ @ 1.50¢, on dock. Steel Plates are 1.30¢ @ 1.35¢ for Tank; 1.40¢ @ 1.45¢ for Shell; 1.60¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.20¢ @ 1.9¢, on dock, and Common 1.10¢ @ 1.20¢; Soft Steel Bars are 1.20¢ @ 1.30¢; Scrap Axles are quotable at 1.35¢ @ 1.50¢, delivered; Steel Axles, 1.35¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢, delivered; Cotton Ties, 60¢ @ 70¢ @ 45-lb bundle, tidewater; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.80¢ @ 1.90¢, and Sleigh Shoe, 1.60¢ @ 1.75¢, delivered.

Old Material.—The steamer "Endeavor" has been chartered to take 1000 to 2000 tons of Old Steel Rails, at steamer's option, to Genoa, Italy, at 12/6 and 5 % primage. An Anchor boat has been chartered for 1000 to 1500 tons at 10/ and 5 % primage. Sellers' views on Old Steel Rails have been run up in view of the export demand, and they are now asking as high as \$11, f.o.b. cars, this city.

At Albany, N. Y., the Momeyer & Story Company of New York City have been incorporated, with a capital stock of \$10,000, to manufacture and deal in Iron and Steel and Metal Goods. The directors are Alvy W. Momeyer, Robert K. Story and August Story, all of New York.

European journals note that there is at present being established at Constantinowka, in South Russia, a large iron and steel works by a company formed in 1891, with a capital of \$2,000,000, and known as the Forges du Donetz. The works will include a large Bessemer steel making plant, a rail rolling mill, foundry, forge and an engineering shop. The plant will, it is expected, be put in operation this year, and it is stated that orders have already been secured for the supply of 100,000 tons of rails to the Russian State railways during 1895-6-7.

Some of the members of the Toronto Board of Trade are a queer lot, remarks the *Canadian Manufacturer*. A few weeks ago they passed strong resolutions urging the Dominion Government to take vigorous action looking to the building up of the Canadian pig iron industry, and later they send a deputation to Ottawa asking that pig iron be placed in the list of non-dutiable articles.

The Klatte method of rolling weldless chain has been introduced at the Germania Works, Neuwied, Germany.

At the Watervliet, N. Y., arsenal gun shop on the morning of May 24, in the presence of a number of interested spectators, the jacket of a 12 inch gun was shrunk on the tube made for it. This is the fourteenth of 12 inch caliber that has been shrunk at the gun factory.

British Metal Market.

[Special Cable Dispatch to *The Iron Age*.]

LONDON, WEDNESDAY, May 30, 1894.

Pig Tin has been inactive and prices are still governed to a great extent by the fluctuations in silver. There was enough speculative buying early in the week to bring about some improvement in prices for forward positions despite freer offerings from the East, and the general market subsequently improved, with somewhat livelier interest shown in futures. At the close the market was firm, though quiet, with quotations at about £72 @ £72. 2/6 for prompts and £71. 10/ for three months' futures.

Copper has been very steady in price and the market is showing fairly firm tone. The better tone to the market is attributed to movement of stock into strong hands, fair outside speculative buying of warrants, together with lessened American offerings and some covering of "bear" accounts. Buying for American account also helped the market. Cash lots are now firmly held. At the close the market was flat and weaker. Merchant Bars were quoted at £39 @ £39. 2/6 for prompts, £39. 7/6 @ £39. 10/ for three months' futures and Best Selected English at £42.

Transactions in Tin Plate have been smaller at the recent advance in prices, and there has been quite general tendency toward conservative policy in view of the supposed near approach of the settlement of the American tariff. On the part of sellers there is still a hardening of prices. Swansea quotations are as follows:

Bessemer Cokes, 14 x 20..... 9/10½ @ 10/1½
Siemens Cokes, 14 x 20..... 10/14½ @ 10/6
Ternes, double box..... 11/3 @ 11/6
Charcoals..... 11/ @ 13/

There has been quite a heavy inquiry for Black Plates for America and the Continent; the latter chiefly, it is asserted, on belief that bottom prices have been reached.

The stock of Tin Plate is at this date about 294,000 boxes.

Pig Lead has met with only slim sale and prices have remained at about £9. 2/6 for Soft Spanish.

Spelter is moving off slowly and prices stand at about £15. 15/ for ordinary Silesian.

Pig Iron warrants rather dull and easy, with latest dealings at 41/3 for Scotch, 35/ @ 35/1½ for Cleveland and 43/7½ @ 43/9 for Hematite.

The New York Shipbuilding Company have received an order from Richard K. Fox for a steam yacht which is intended to compass a speed of 30 knots an hour. The yacht will be 100 feet long, flush decked, with a small steering wheel forward. She will be fitted with quadruple expansion engines, developing nearly 1000 horsepower, steam being furnished by two water tube boilers. The hull will be of steel. The designers are Gardner & Mosher, and the construction will be supervised by Irving Cox.

The American House Beautiful.

In referring to the homes of American business men and contrasting them with the stately and the cottage homes of his own land, a writer in a late issue of *All the Year Round* presents the following views, which may prove interesting to many of our readers:

We Englishmen are proud, and justly so, of the stately and the cottage homes of our land. There is nothing like them elsewhere in the world, for they possess peculiar features of their own—the former in their antiquity and their associations, the latter in their own beauty and that of their surroundings. But the great mass of us live neither in stately homes nor in cottages, and of our residences—externally, at any rate—we have very small reason to be proud. Now, as the Americans have no stately homes of our English type, with the exception of the fine old colonial residences of Virginia and New England—and as their cottage homes are modern, practical and consequently ugly, and, as we have said, there is a wealth of refinement in many American minds, they have succeeded in making the villa residences of their big city suburbs the most beautiful in the world. I call them "villa residences," despite the fact that many of them are mansions in size and feature, because they are the homes of business men. The town residences of American business men are beautiful internally, but being in streets and rows they necessarily lack the external features which induce us to select the suburban home as a type of the American House Beautiful.

ORIGINALITY IN DESIGN.

In a survey of these the first fact which strikes the eye of the stranger is the extraordinary fertility of the American architectural brain in original design. A family likeness pervades all London suburban houses, be they north or south of the Thames. If there be one pretty house, there will be scores exactly like it all around; but until within the past very few years the London suburban builder reared as fast, as cheaply, and, in consequence, as inartistically as he could, with the result that the very great majority of London suburban houses are absolutely hideous. But in an American suburb, let us say for example, Brookline, near Boston, a suburb extending over miles of hill and dale, and planted thickly with houses, it may be asserted that not half a dozen buildings are exactly alike. The straining after the original and the striking has, of course, resulted in the erection of a few monstrosities, and of some houses more eccentric than pleasing in design, but the general average is exceedingly high. In this general originality of house design I seem to see a far greater instance of the much vaunted American liberty and independence than in any of the political and social institutions of the country.

INTERIORS.

After we have surveyed the exteriors of the houses and proceed to their interiors another new fact strikes us, and this is how very much better the different classes of American business men are housed than are their corresponding grades in our own country. Shop walkers, counter men and good artisans go home every evening to houses which in England would not be deemed unworthy of city men of good position. The taste in furnishing and decoration may not always be as good as the houses themselves, but there is nothing corresponding to what may be called our London "genteel villa resi-

dence," and the bank clerk, instead of huddling in one yellow brick box in a long row with a big name shuts himself up for the evening in his own little detached castle, which contains on a small scale all the accommodation and many more of the conveniences of an English gentleman's house. As we rise higher in the scale we reach the American House Beautiful, as distinguished from the American House Magnificent.

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HARDWARE.

Condition of Trade.

THERE has been little change in the general situation since our last review of the market. The volume of business is moderate, and is probably diminished by the fact that the end of the month is near. Advices from the retail trade indicate that business is in most sections below the average, but that on the whole the general conditions are fairly satisfactory. While there is less building than usual there is evidently an improvement in this direction, and manufacturers of Builders' Hardware refer to a somewhat increased demand. Seasonable goods are moving in nearly the usual quantities, but even in this branch of trade there is some complaint. In the matter of prices there is little new to report. The raw material is affected somewhat by the existing strikes, but their influence has not as yet been very marked on Hardware. Nails and Barb Wire, however, and some other heavy goods are somewhat stronger in price, and on some lines higher quotations are ruling. The future course of the market is canvassed by the trade with much interest, but as yet there are no indications of an important improvement either in demand or prices in the near future. It is, however, to be expected that a fair business will be done during the next month or two, and it is hoped that in the fall business will assume good proportions.

Chicago.

(By Telegraph.)

The Shelf Hardware trade was further stimulated the past week by the notice of an advance in freight rates to Western points to take effect on the 28th. The Western dealers, who had been expecting low freight rates to continue indefinitely, were then impelled to hurry in their orders for immediate shipment of all classes of goods which they would require for the next two or three months. The activity thus caused has greatly increased the volume of business, but it is expected somewhat at the expense of the immediate future. It will not be surprising if trade should now prove dull for some time until the goods thus shipped are distributed. Manufacturers' agents have recently enjoyed a very much better demand for Carriage Bolts, Machine Bolts and other staple articles which have been

ordered by jobbers in much larger quantities, reminding the trade of old time orders. The hardening of prices on raw material may have caused some houses to stock up with goods of this character. Recent prices have been so low that they have little to fear of any further reduction. They may have done wisely in anticipating their future requirements in this way. Roofing Plates continue as scarce as ever, and jobbers state that they are unable to accumulate any stock, the goods being shipped out about as rapidly as they are received.

St. Louis.

(By Telegraph.)

Hardware jobbers report an excellent demand, which has been caused largely by the low freight rates to the West. There continues to be more or less complaint regarding the inability of jobbers to secure sufficient quantities of Tin Plate to supply their trade. There is a general improvement in prices. Barb Wire, Wire and Cut Nails, Wire Cloth, &c., are all higher. There appears to be a lack of confidence, however, and country dealers are only ordering in very moderate quantities, and it is only the inducement of cut freight rates which will increase these orders. Roofing manufacturers are all busy, and the same report is made by the manufacturers of Gasoline Stoves. Wire Cloth is getting scarce and is now quoted at \$1.60, at which price some large orders are being filled. Collections are fair.

Notes on Prices.

Wire Nails.—During the past week the Wire Nail market has been steady with a slightly upward tendency. Manufacturers have withdrawn their outstanding quotations at low figures and are now naming \$1.15 for carload lots at mill, a figure which is sometimes slightly shaded. The advance in the price of the raw material and the uncertainty in regard to the supply of fuel are the principal reasons for the strength which characterizes this line. The volume of business has, however, fallen off perceptibly, as the trade hesitate about placing orders at the advanced prices which are ruling, buying only in such lots as are required to meet their present needs. Small lots from store in New York are held at \$1.25 to \$1.30.

Chicago, by Telegraph.—Manufacturers report rather a quiet week. The advance made in factory prices has been well maintained, but buyers are not inclined to pay the great advance now asked on recent low prices. They are

able for the present to supply their wants from jobbers having heavy stocks who are willing to sell at slightly lower rates than manufacturers. This, of course, only a temporary condition, which may soon be expected to terminate. The higher price of Steel Billets and Wire Rods will probably prevent manufacturers from being in a hurry to reduce their quotations. Factory lots are quoted at about \$1.20, Chicago. Jobbers quote small lots at the same price.

Cut Nails.—The Cut Nail market is without material change, though perhaps slightly firmer in the matter of price, in sympathy with the advances which have been made in Wire Nails. The demand is fair, but not especially heavy. The Eastern market is represented by the quotation of 95 cents to \$1 for Nails delivered on dock in New York. Small lots from store are held at \$1.10 to \$1.15.

Chicago, by Telegraph.—The condition of the market continues about as reported last week. Orders are coming in fairly well from jobbers in this vicinity and from various Northwestern points. Manufacturers quote 90 to 95 cents on 55-cent average. Small lots are selling at \$1.05 to \$1.10 from stock.

Barb Wire.—The demand is only moderate, but manufacturers are well supplied with orders. Prices are well maintained, the market being represented by the following quotations for Four Point Galvanized, delivered at the points named: Pittsburgh, \$2.05 to \$2.15; Cleveland, \$2.10 to \$2.20; Cincinnati or Allentown, \$2.15 to \$2.25; Chicago or New York, \$2.20 to \$2.30.

Chicago, by Telegraph.—The advance in Western freight rates has had some effect on the Barb Wire trade, but not as great as might be expected. Western jobbers have had previous experience in stocking up on Barb Wire in times of low freights and will not risk being caught again. Manufacturers who had made special efforts to handle a larger trade from that section did not meet with satisfactory returns. Probably they would have done better if they had at the same time cut their prices, but this they were not willing to do with the higher rates ruling on their raw materials. Only a fair business is consequently reported for the week. Manufacturers are now looking forward to a quiet season extending over the summer months. Prices are maintained on a basis of \$2.30 to \$2.40 for small lots of Galvanized Barb Wire.

from stock, with 10 cents less for carloads.

Cordage.—The Cordage market continues in excellent condition as regards price, the advances which were recently made being well maintained. The demand is fair, but not especially heavy. It is thought not unlikely that slightly higher prices may rule before long.

Strap and T Hinges.—In order to correct some inequalities in the list on Strap and T Hinges, the following revised list was adopted by the manufacturers of these goods on May 22. The discounts remain unchanged:

<i>Light Strap Hinges.</i>						
Inches.....	3	4	5	6	7	
Per doz. prs...	\$0.55	.70	.85	1.05	1.30	
Inches.....	8	10	12	14	16	
Per doz. prs...	\$1.50	2.00	3.25	4.00	5.00	

<i>Heavy Strap Hinges.</i>						
Inches.....			4		5	
Per doz. prs.....			\$0.80		1.00	
Inches.....	6	8	10	12	14	16
Cents per pound....	7½	7	6½	6½	6½	6½

<i>Light T Hinges.</i>						
Inches.....	3	4	5	6		
Per doz. prs.....	\$0.65	.70	.80	.95		
Inches.....	8	10	12	14		
Per doz. prs.....	\$1.25	1.60	2.50	3.25		

<i>Heavy T Hinges.</i>						
Inches.....	4	5	6	8	10	
Per doz. prs...	\$0.80	.90	1.00	1.35	1.90	
Inches.....		12	14	16	18	
Per doz. prs.....		\$3.00	4.00	4.50	5.00	

<i>Extra Heavy T Hinges.</i>						
5 inches, \$1.35 per doz. prs.						
Inches.....	6	8	10	12	14	16
Cents per pound	8	7½	7	7	7	7

<i>Long Chest Hinges.</i>						
Inches.....	6	8	10	12		
Per doz. prs.....	\$0.90	1.10	1.40	1.75		

<i>Hinge Hasps.</i>						
Inches.....	3	4½	6	8	10	12
Per doz. prs..	\$0.95	1.20	1.50	2.00	2.50	4.00
Crate Hasps (Single Swivel), 3-inch, 95 cents per doz. prs.						
Crate Hinges, 3-inch, 55 cents per doz. prs.						

Dixon's Cycle Lubricant.—This article was described in our last issue as put on the market by the Joseph Dixon Crucible Company, Jersey City, N. J. In single gross quantities the price to the trade is \$7.50 per gross, and in 5-gross quantities and over \$6 per gross.

Phenix Meat Cutters.—Phenix Meat Cutters, manufactured by Sargent & Co., 37 Chambers street, New York, and illustrated in *The Iron Age* May 24, 1894, are sold at a discount of 66½ per cent. from the following list:

With Clamp, Galvanized.

	Per dozen.
No. 130, small family size.....	\$48
No. 131, large family size.....	72
No. 132, very large size.....	120

With Feet, Galvanized.

No. 141, large family size.....	60
No. 142, very large size.....	96

Glass.—The continued bad weather of the past week further curtailed the demand for Glass, though quotations for American Window Glass remain firm at 85 per cent. discount for single and 85 and 5 per cent. for double strength, in car lots. The interesting features in the Glass trade during the past week have been the banking of 20 pots because of the lack of coal, the closing

down of 20 pots on account of fire, and the announcement of the organization of the Indiana Window Glass Manufacturers' Association, with headquarters at Anderson, Ind. It is reported that a central agency has been formed which will handle the products of all the factories in Indiana with the exception of two or three. It is understood that 15 Glass manufacturers of Western Pennsylvania, Ohio and Illinois held a session in Chicago last week, though all information as to the object of the meeting was withheld. It would appear that manufacturers in some sections of the country were tired of the fierce competition which has existed during the present fire, and that measures are being taken to put an end to it. If the coal situation continues as at present it will seriously affect Glass factories depending upon coal for fuel and further decrease production. Plate Glass is quoted at 70 and 10 and 5 per cent. discount, with somewhat of a falling off in demand.

Southern Hardware Jobbers' Association.

THE ARRANGEMENTS for the meeting at Richmond June 5, 6 and 7 are progressing very satisfactorily, and the indications point to an exceptionally large gathering and a meeting of unusual interest and importance. The relations between manufacturers and jobbers is one of the subjects to be considered, and the following sub-committees have been appointed to confer with manufacturers in leading lines:

Planters' Eye Hoes.

Jno. S. Clarke of Clarke Hardware Company, chairman.
Walter Keith of J. H. Fall & Co.
G. M. Barnett of Teague, Barnett & Co.
W. E. Gibbins of W. W. Woodruff & Co.
Clayton Giles of Giles & Murchison.
J. C. Vance of Vance & Kirby.

Turning Plows.

Orin L. Cottrell of Cottrell, Watkins & Co., chairman.
J. J. Mandlebaum of Fones Bros. Hardware Company.
G. R. Vaughn of Barney-Cavanaugh Hardware Company.
C. M. McClung of C. M. McClung & Co.
A. H. Fall of Gray, Fall & Co.
L. M. Beck of Beck & Gregg Hardware Company.

Steel Shapes.

Fred'k Orgill of Orgill Bros. & Co., chairman.
R. M. Dudley of Dudley Bros. & Black.
Green & Caldwell.
J. C. Kirkpatrick of Kirkpatrick Hardware Company.
Lee Richardson of Lee Richardson & Co.
Clark, Ainslie & Co.

Barb and Smooth Wire.

Chas. H. Ireland of Odell Hardware Company, chairman.
Jno. S. Brown of Geo. Brown.
B. T. Haynes of Rome Hardware Company.
W. W. Dickinson of Dickinson Hardware Company.

Edward Buford of Buford Bros. Christian, Beasley & Co.
Cunningham Hardware Company.

Shovels and Spades.

O. B. Barker of Bell, Barker & Jennings, chairman.
George E. King of King Hardware Company.
W. G. Simmons of J. H. Fall & Co. May & Thomas.
E. W. Clarke of E. C. Atkins & Co.
J. C. Luttrell of S. B. Luttrell & Co.

Handled Hoes.

J. J. Westcoat of Marshall, Westcoat & Co., chairman.
Foster Hardware Company.
John M. Gray, Jr., of John M. Gray & Co.
W. A. Gregg of Beck & Gregg Hardware Company.
The S. B. Hubbard Company.
J. D. Moore of Moore & Handley Hardware Company.

Ammunition, Cartridges, Caps and Shells.

W. S. Bransford of Bransford Hardware Company, chairman.
Chas. H. Watkins of Watkins Hardware Company.
W. H. Kettig of Milner & Kettig.
P. M. Brown of Brown, Weddington & Co.
H. A. Palmer of Palmer Hardware Company.
A. A. Martin of Watters & Martin.

Saws.

W. A. Chenoweth of Francis-Chenoweth Hardware Company, chairman.
Charles Leonard.
J. M. Shafer.
A. M. Tenison & Son.
Teague & Son.

Axes and Hatchets.

W. L. Magill of Carter-Magill Hardware Company, chairman.
J. C. Sproule, president Anniston Hardware Company.
N. A. Gladding, manager E. C. Atkins & Co.
H. G. Lipscomb & Co.
Donnan & Cannon.
Jno. E. Gannaway.

Special Goods Manufactured by Enterprise Mfg. Company, Stanley Rule & Level Company, White Mountain Freezer Company, &c.

L. C. Frazer, chairman.
J. B. Yerkes of Florida Hardware Company.
J. H. Watters of Watters & Martin.
D. M. Snow & Co.
Athens Hardware Company.

President Langstaff has sent the following general letter to the members of the association, in which emphasis is laid on the importance and significance of the coming meeting and the necessity of active co-operation on the part of the members in the work of the association:

It is evident that the invitations that have been, or will be, extended to manufacturers will be accepted, and that there will be many more of them at Richmond convention to confer with the association than I anticipated. It is very desirable that the session at Richmond should be as brief as possible, consistent with the important questions to be considered, and the beneficial results that we hope to obtain.

I have, therefore, as your president, assumed to appoint sub-committees, including all members, to confer with manufacturers, so that we can proceed to business as soon as we reach Richmond, in separate committee rooms. Should any changes in these sub-

committees be found desirable, such changes can be made. In forming these sub-committees I have had reference to letters received from members in which they advised me of the articles they wished regulated. It is very important that each member on these committees confer with the other members of the association in the city in which he resides relative to any abuses connected with the distribution of these goods from the factories, and to make a careful written report of the same and to embody in it some plan by which the present methods may be so improved as to yield a reasonable profit to the jobber.

Unless this is done at once, before we go to Richmond, we must not expect to derive from the convention the vast business benefits that are possible.

I know that some members are actively engaged in the preparation of reports on subjects that I have assigned to them.

I have, as your president, given to the matters pertaining to this convention more time, thought and attention, for the past 60 days, than to my company's business.

Each of you have had evidence of this devotion. I have evidence before me to-day from manufacturers of the interest they are taking in this convention.

I have letters before me manifesting a desire on their part to confer with us and to provide for reasonable protection to the members of this association. I have a letter before me from a very prominent manufacturer, who has already, at my suggestion, arranged selling prices on one line of his goods so that the jobber will obtain a profit of over 20 per cent. There is no reason why every manufacturer should not afford us reasonable protection for jobbing his products.

It is as clear to me as the noonday sun, with no cloud between, that if you will act on the suggestions and requests that I have made of you in my various circulars and letters; that if you will be alive to your own interests; that if each of you will devote one-fifth of the time I have devoted in obtaining and compiling information as requested before we go to Richmond, that we will obtain benefits that you do not now anticipate.

We will have the opportunity of removing many of the abuses that now exist, and prevent the birth of others, of which trade conditions are now so pregnant.

Each member must feel that he is personally responsible for the success of this convention.

That he must, by his personal presence, sustain it, and that he must be prepared to emphasize the statement of his president and the chairman of his committees, as outlined in the subject circulars sent you. I beg of you to so arrange your business, and your stock taking, in which so many members are now, or will be engaged, so that you will, by your presence and by your reports at Richmond, confirm to me by these "outward and visible signs" the appreciation that so many of you have expressed in your letters for the service I may have rendered the association.

It is of vital importance that you send promptly to the various manufacturers whose products you buy the invitations that I have prepared in blank, and which will be sent you by the secretary within the next few days.

If I have permitted my enthusiasm to be too aggressive in my suggestions to you, kindly remember that but one thought has actuated me, and that is the complete success of the Southern Hardware Jobbers' Association convention at Richmond.

A circular of invitation and order of business has also been issued, which will be of interest as giving information in regard to the programme of the meeting:

The association extends to you and all parties interested in the business of the convention, as outlined in trade journals of last week, an invitation to the convention, and to be present at such meetings as are not reserved for the exclusive attendance of active members.

You are earnestly requested to invite ladies to accompany you.

To provide for an early acquaintance of all parties with each other, who attend the convention of Southern Hardware Jobbers' Association, to be held in Richmond, June 5, 6 and 7, a general meeting will occur on Tuesday morning, June 5, embracing the members of the association, Senior Travelers' Reception Committee, manufacturers and members of firms, traveling salesmen and other invited guests and citizens of Richmond.

Governor O'Ferrall of Virginia, or Mayor Ellyson of Richmond, will deliver an address of welcome, to which the president of the association will briefly respond and state the objects of the convention.

Several five-minute speeches will follow.

The active members of this association will then adjourn to adjoining room and take up the initial business of the meeting, leaving the invited guests in the hands of the

SENIOR TRAVELERS' RECEPTION COMMITTEE.

Irby Bennett of Winchester Repeating Arms Company, chairman.

Ed. Bernard of Chas. Parker Company.

G. A. Seaver of Jno. Russell Cutlery Company.

Geo. Coffin of Lalance & Grosjean Mfg. Company.

Chas. J. Healy of New York.

Arthur Brittan of Brittan, Graham & Mathes.

J. W. Keightley of B. F. Avery & Sons.

W. R. Penniman of Asheville, N. C.

H. Rashcoe of St. Louis, Mo.

H. H. Beers of New York.

T. P. Burke of J. C. McCarty & Co.

Chas. Campbell of Peck, Stow & Wilcox Company.

Fred. Seeley of Wiebusch & Hilger.

Samuel Disston of Henry Disston & Sons.

Chas. H. Weir of Baltimore.

Frank Wright of Alfred Field & Co.

O. C. Mead of New York.

Jas. Surplus of Surplus, Dunn & Alder.

Jno. K. Wilson of Baltimore.

Ed. Ingalls of Atha Tool Company.

Thos. Ellis of Hermann Boker & Co.

W. E. Austin of Southern Agricultural Works.

C. F. Guyon of C. F. Guyon Company.

S. Kastor of A. Kastor & Bros.

S. B. Bispham of Russell & Erwin Mfg. Company.

The various visitors will be invited to register in a book prepared for that purpose before leaving the room in which this opening meeting has taken place, at which time they will receive a ribbon of distinction and a programme of the order of business, which will embrace information pertaining to the banquet.

Men of national reputation, both in trade and State craft, have kindly consented to be present at the banquet.

You can secure special railroad rates by applying to agent in your city. Special reduced rates have been secured at hotels in Richmond.

During the meeting the association will be addressed by Governor O'Ferrall of Virginia, Mayor J. Taylor Ellyson of Richmond and Ashton Starke. The Tredegar Company of Richmond have invited the association to join them in an excursion on June 6 to Dutch Gap and other points of interest on the James. The Richmond & Danville Railroad have also invited the association to take an excursion to Chesapeake Bay via West Point, visiting the old historic town of Yorktown. The Richmond Cedar Works will give a luncheon some time during the meeting to which the members of the association and their guests will be invited.

The local committee is composed of Chas. H. Watkins of Watkins Hardware Company, chairman; W. S. and John Donnan of W. S. Donnan & Co., and O. L. Cottrell and W. S. Robertson of Cottrell, Watkins & Co. Arthur B. Clark of the Old Dominion Iron and Nail Works and Jacob Anderson of the Tredegar Company have also been requested to act with them.

Restricted Credit.

THE DEPRESSION in business should not be viewed by the retail trade as an unmitigated evil having no redeeming features. It has taught many lessons from which additional prosperity should result when entering upon the period of prosperity which is looked for in the near future. Recent circumstances have necessitated a more conservative method of conducting business, resulting in cutting down expenses, carrying more limited but possibly better assorted stocks, and a diminution in the amount of credit asked and extended. The stress of necessity has been felt by the merchant and has given backbone, when refusing credit to customers who were known to be poor pay, or who would have to be carried indefinitely.

The present is undoubtedly an auspicious time to follow up the practice of restricting credit, and thereby get nearer to a cash basis of selling and buying; if not to abolish the credit system altogether. Customers and merchants have become somewhat accustomed to the altered conditions in business, and this opportunity which has been so dearly purchased should not be recklessly thrown away.

Hints as to Bill Heads.

IT IS PRESUMED that merchants send out printed matter because they want people to read it, and if people will not read it there is no use in having it printed. Let the business man ask himself if he reads other people's printed matter.

Nearly all printed matter is too long, too technical, and it generally falls flat.

The bill head is not an advertisement. There is no room on the bill head for an enumeration of all the things the merchant keeps and does.

Some general term should be used to

describe the business, such as "Hardware and Stoves." Terms also should be given, and any other information relative to the payment of the bill.

Many bill heads are printed in fancy and illegible type, especially the name and address. The name of the State is often omitted from bill heads, and customers outside of the State are not sure of the location of the town.

It is generally advisable to use one series of type throughout on a bill head. It is more artistic and more pleasing to the eye.

Opening of the Hardware Club.

THE FINISHING TOUCHES are being given to the equipment of the Hardware Club of this city, which will be open for inspection on Thursday, 31st inst. The regular operation of the club, with the service of lunch and dinner for members and their guests, will begin the following day, June 1. Congratulations are to be extended to this organization for the manner in which their broad and comprehensive plans have been carried into effect.

The following gentlemen have recently been elected members of the club:

FRANK P. ABBOTT,
29 Barclay street, New York.
WILLIAM H. BAKER,
Vice-president Postal Telegraph
Cable Company, New York.
J. EDGAR BULL,
Postal Telegraph Building,
New York.
ABRAHAM BUSSING,
President Ausable Horse Nail
Company, New York.
A. B. CHANDLER,
President Postal Telegraph
Cable Company, New York.
HON. LEWIS J. CONLON,
Judge City Court,
New York.
FRANK E. CONOVER,
Postal Telegraph Building,
New York.
WARREN A. CONOVER,
Postal Telegraph Building,
New York.
W. H. EDSALL,
H. L. Judd & Co.,
New York.
WILLIAM E. ELDERED,
Postal Telegraph Building,
New York.
JOHN GALT,
Postal Telegraph Building,
New York.
AUGUSTUS GAYLORD,
Ammunition Manufacturers'
Association, New York.
LIVINGSTON GIFFORD,
Postal Telegraph Building,
New York.
WILLIAM TYSON GOOCH,
Postal Telegraph Building,
New York.
GEO. A. GRAHAM,
John H. Graham & Co.,
New York.

JAMES T. HALL,
1307 Broadway, New York.
GEORGE EDWARD HARDING,
Postal Telegraph Building,
New York.
H. McL. HARDING,
Postal Telegraph Building,
New York.
B. A. HAWLEY,
45 Chambers street, New York.
LEE KOHNS,
42-48 Warren street, New York.
JOHN W. MACKAY,
President Commercial Cable
Company, New York.
J. W. MACKAY, Jr.,
President Forcite Powder
Company, New York.
WM. B. MERRALL,
Acker, Merrill & Condit,
New York.
EDWARD MEYER,
45 Chambers street, New York.
CHARLES E. MITCHELL,
Times Building, New York.
CHARLES MORRILL,
35 Warren street, New York.
PATRICK F. MURPHY,
Boston, Mass.
WILLIAM S. PITCAIRN,
46 Murray street, New York.
E. C. PLATT,
Treasurer Commercial Cable
Company, New York.
D. S. PLUME,
Plume & Atwood Mfg.
Company, Waterbury, Conn.
CHARLES PUTZEL,
253 Broadway, New York.
FRANK J. SPRAGUE,
Vice president Sprague Electric
Elevator Company, New York.
W. M. TAUSSIG,
84 and 86 Chambers street,
New York.
ROBERT M. THOMPSON,
President Orford Copper
Company, New York.
GEO. G. WARD,
Vice-president Commercial
Cable Company, New York.

Glass Screens.

AN interesting series of experiments, according to reports in a German technical paper, have been made by Richard Zsigmondy of Vienna on the transmission of heat through different kinds of glass. It has long been known that bodies equally transparent did not let through the heat that accompanied the light with corresponding freedom, and, furthermore, that some opaque bodies permitted the heat to pass freely. Ordinary clear glass cut off a portion of the heat, and this quality adapted plate glass to be used as fire screens. Rock salt, on the other hand, permitted both light and heat to pass freely, while a black solution of iodine, which cut off the light entirely, offered very little obstruction to the radiant heat. All these and many similar facts have been known for a number of years, but there is still a good deal to be learned in the field of heat and light transmission if

valuable practical results were to come of the investigation.

Mr. Zsigmondy in the experiments alluded to began with the idea that alum resisted the heat rays, and so he had glass made containing a large per cent. of alumina, but while the results showed a much greater amount of heat cut off by the alum glass than by ordinary glass there was reason to suspect that the difference was rather due to the presence of iron on the surface than to the salts of aluminum in the body of the glass itself. Without describing the experiments in detail it is enough to say that, acting on the suspicion that the iron was the cause of the glass cutting off the heat, a number of specimens of glass were prepared containing from 1 to 4 per cent. of iron oxide. The first sample, containing 1 per cent., was for certain reasons the most satisfactory. The glass was about $\frac{1}{8}$ inch thick and of a light blue color, and when tested with a gas flame it permitted less than 1 per cent. of the heat to pass, while with ordinary glass of similar thickness 60 per cent. of the heat was transmitted. Tested by the sun the iron glass transmitted 12 per cent. of the heat, compared with 86 per cent. transmitted by common glass.

The possible application of this discovery is of more than usual interest, for there is a very wide field of application to a greater or less transparent glass that will at the same time be opaque to radiant heat. The color would furthermore be an advantage in many instances, for it would add to the decorative effect of the glass. Plate-glass screens for open fires could be made of such a glass to advantage, but perhaps what would be of the greatest usefulness would be lamp shades and chimneys around wicks burning kerosene. Nowadays lamps are used a great deal for evening reading as well as for general illumination, and if a transparent shade could be made which would cut off the heat from the face and head of a person reading nearby the effect would be decidedly pleasant and also probably of advantage to the health. It is to be hoped that this reported discovery is not like those many rumored inventions which are always being announced as going to revolutionize the world and which never amount to anything more than a rumor. The discovery we have referred to is, however, entirely probable, and furthermore is reported by a German technical paper of high standing.

JAMES W. EUSTIS COMPANY, manufacturers and dealers in Hardware specialties, 19 Pearl street, Boston, are offering to the Hardware trade a line of Idlewild Hammocks in a sample bale made up to introduce the goods. Each bale contains twelve Hammocks of medium and low priced goods and they will bring a handsome profit.

The Hess Spring & Axle Company of Carthage, Ohio, recently chartered, have a capital of \$100,000, not \$10,000, as was erroneously printed.

Export Notes.

THE FINANCIAL SITUATION in India is said to be critical and bordering on a panic. Trade is becoming paralyzed, and unless measures of relief are promptly adopted it is thought, that a great commercial catastrophe in that country is inevitable. Some large forced sales of India Council bills recently have, in the opinion of Indian financiers, mainly contributed to the present alarming condition of affairs, together with the depreciation in silver and consequent loss of exchange. India's foreign trade showed a serious falling off in the last fiscal year.

Announcement is made that the Cincinnati Board of Trade propose to establish schools for instruction in the Spanish and Portuguese languages and in the laws and customs of Central and South American countries, with a view to extending trade between Cincinnati and those countries.

The Pan-American Company now hope to open their permanent exhibition of American manufactured goods and foreign natural products or raw materials about June 10. This project has been in course of preparation for some months. The Industrial Building, at Lexington avenue and Forty-third street, covering an entire square, with 6½ acres of space for exhibition purposes, has been secured for a term of years. Among the managing directors of the company are Wm. I. Buchanan, late chief of the Department of Agriculture at the Columbian Exposition; Wm. E. Curtis, formerly director of the Bureau of American Republics at Washington, and Wm. Harper of this city. As stated by the Hon. John R. G. Pitkin, for four years American Minister to the Argentine Republic, now one of the officials of the company, this is an American struggle for American industries in markets naturally ours. The enterprise has been indorsed by the New York Chamber of Commerce. The New York Board of Trade and Transportation, at a recent regular meeting, unanimously adopted a resolution offered by Ambrose Snow, formerly president of the board, commending the undertaking, which seeks to extend the area of consumption into the other countries of this hemisphere, to the commercial bodies, merchants and manufacturers of the United States. The income from which to support the exhibition will be derived from the rental of space to exhibitors, no admission being charged to visitors. A bureau of information and reading room will be opened, where may be found data and statistical information, periodicals, catalogues, trade directories and literature covering subjects of value to those interested. It is proposed to maintain a staff of five commercial agents in the trade centers of Europe to collect information and forward to the company. A similar corps of six agents will be placed at advantageous points in the Latin American countries south of us. The object of this is to show producers here what their European competitors are doing in the foreign market, and suggest to home manufacturers what may be produced and sold with profit.

For the convenience of their customers throughout the colonies the Bissell Carpet Sweeper Company of Grand Rapids, Mich., have recently established agencies at 231 Elizabeth street, Melbourne, and 3 Wynyard street, Sydney, which they have stocked with a complete line of their several brands of Sweepers, together with ex-

tra parts, easels and exhibitors. These stores will be under the charge of the Sherman & Lyon Company's Australian house.

A French consul in Burmah reports to his government that Germany is sending large quantities of cheap Cutlery to that country, which hampers the sale of English goods. Belgium and Austria also find there a good market for enameled household utensils, Cutlery, Files, and other articles of ordinary quality.

A French official report from Central Africa states that Hardware is in great demand in that country, but as it is comparatively heavy the Tripoli merchants take as little as possible. The most salable goods are certain kinds of Tinware coming from Hamburg, Padlocks, Hinges, Chains from 3 to 5 mm., Nails, and other articles of Arab manufacture. Square Iron Bars of 115 mm. and Copper Bars of the same thickness are also in demand.

Repair Shops in the Hardware Store.

A GENTLEMAN connected with the trade who has had experience in Bicycle repairing makes the following comments and suggestions regarding repairing in the store, which will be of interest to those who are studying the advisability of running a repair shop in connection with their business:

Nearly all repair work on standard makes of Cycles can be done in any Hardware store. The tin shop usually has a man who takes pleasure in doing jobs of this kind. There are certain kinds of work that should not be attempted, however, as in case of serious accidents when frames are broken, although frames that are only sprung can usually be made right by careful work. Broken frames should be sent to some factory or repair shop where the brazing can be done perfectly. The repairman should understand thoroughly the principle of the bearings in every Cycle that he repairs, and be sure that the means for keeping the cones from turning are properly used before letting the wheel leave his shop. The goods to be carried in stock for repairs depend entirely upon the number and make of wheels in use and amount of business done in this line. Spokes of such sizes and styles as are most used, nipples, a few rims, valves, and valves and stems complete, balls, cement and materials for repairing all makes of tires should always be on hand for immediate use. A point that dealers and repairmen often lose sight of is putting entire new wheels into machines that now have solid or cushion tires. There are thousands of good wheels of this class in use, and by putting in light wheels with pneumatic tires they become all their owners want; and for such jobs a good price can be obtained. The old wheels will also be of value in making repairs on similar machines. The weight can usually be reduced about 10 pounds by substituting wheels with pneumatic tires for the old ones, and with one less tooth on the rear sprocket will usually give about the right gear for the new wheels, there being about that difference in cushion and pneumatic tires. High priced wheels should not be used for changing from cushion to pneumatic. Dealers should never let customers impose upon them by claiming repairs should be made free of charge when breakages are the fault of riders.

Bicycle Notes.

POPE MFG. COMPANY, Boston, and 12 Warren street, New York, issue some dainty Bicycle pamphlets devoted to Columbia Bicycles. One pamphlet illustrates their line of wheels and gives several reasons why a Columbia should be used as a mount. Particular attention is called to the Columbia light Model 34 and to the Special Model 35, a ladies' light machine. A second pamphlet contains directions regarding the care of Columbia Bicycles and repair of tires, showing by illustrations the amount of oil required on the different bearings, the manner of locating leaks in the tire, tools and their use in repairing punctures, &c.

THE SYRACUSE CYCLE COMPANY, Syracuse, N. Y., issue a tastily arranged and artistically printed folder, bringing out the good points of Syracuse Bicycles. Poetry and prose each play important parts in the make up of the circular, while a page is devoted to letters from the trade and announcements of races in which first and second prizes were won by riders on the crimson rims. The company's escutcheon, or coat of arms, bears these legends: "Choose a beauty;" "Buy a seller;" "Win a buyer;" "Sell a winner."

BEVIN BROS. MFG. COMPANY, East Hampton, Conn., issue an illustrated catalogue devoted to Bicycle Bells and specialties. The Beach Bell is shown in two styles; also the feather weight, double stroke Harrison Alarm, single stroke and middle weight Bells, Trouser Guards, Lamp Brackets, Toe Clips, Oil Hole Covers and Nipple Grip are also illustrated.

Albany Nickel Plating & Manufacturing Works.

ALBANY NICKEL PLATING & MANUFACTURING WORKS, C. H. Angus, proprietor, Albany, N. Y., call attention to their superior facilities for nickel and brass plating and finishing, bronzing, tinning and japanning. The plant is also equipped with all the most approved appliances for doing every kind of polishing, plating, finishing and coloring. Mr. Angus is also prepared to do all kinds of machine work, manufacturing or jobbing, and makes the following remarks concerning his machine shop, brass foundry, &c.:

The machine shop is furnished with modern labor saving tools, insuring the rapid and accurate execution of work. Particular attention will be given to manufacturing Specialties and Light Machinery, and correspondence is solicited with those desiring to contract in this line. The plant includes a first-class Brass foundry, and Brass Castings of all kinds will be furnished on short notice, guaranteed smooth and sound, true to pattern and of the best metal. Brass Gates and Rails, Store and Showcase Fixtures, Brass and Nickel Signs of any style and design made promptly to order. Where articles are produced complete in one establishment, carefully arranged for easy and rapid production, under the personal supervision of its head, it is obvious that better and cheaper work will be secured than where they are produced by different concerns. My facilities enable me to offer this advantage to my patrons.

Arrangement of Stores.

PRESTON BROS.

PRESTON BROS., Norwich, Conn., have many convenient devices for sampling and displaying goods, some of which are illustrated

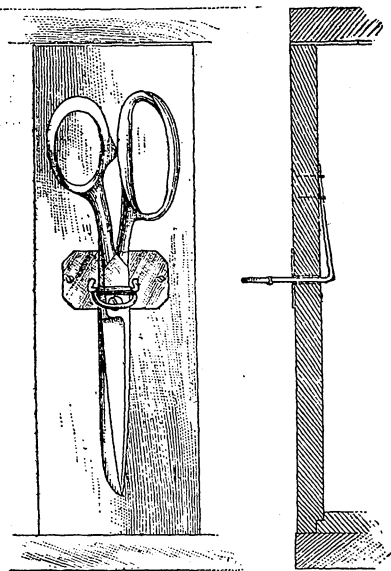


Fig. 850.—Sampling Shears.

in the accompanying cuts. It will be noticed that these are largely original with this concern and not at all expen-

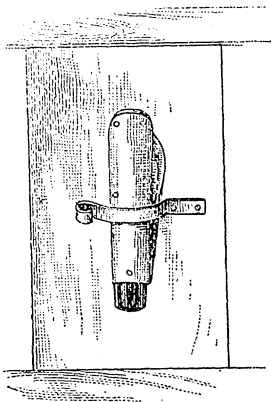


Fig. 851.—Sample of Pocket Cutlery.

sive. Fig. 850 illustrates their manner of sampling Shears, on boxes made

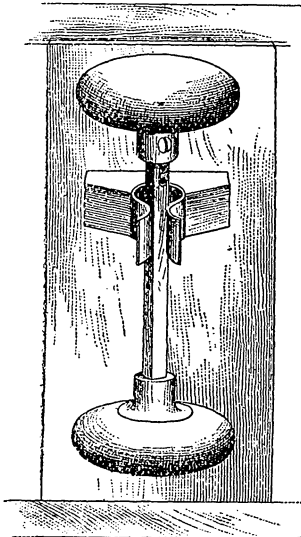


Fig. 852.—Door Knob Sample.

of $\frac{3}{8}$ -inch stuff, finished in natural wood, 11 inches long, $7\frac{1}{2}$ inches high and $2\frac{1}{2}$ inches wide. A sheet brass

plate, $\frac{3}{8} \times 1\frac{3}{8}$ inches in size, is screwed on to the face of the box, having holes in it through which the spring passes. The spring is made of No. 16 brass spring wire and fastened to the inside of the box with blind staples. A ring for pulling out the spring is attached to the spring by a sheet brass lock, the whole forming a neat and finished appearance.

Pocket Cutlery is sampled on similar boxes, being 11 x 5 inches, 3 inches

circle. The spring is $\frac{7}{8}$ inch wide, or as wide as the block, and is so formed that it holds the shank of the Knob firmly, and holds the Knob perpendicularly without its coming in contact with or rubbing the face of the box. This arrangement is spoken of as one of the most convenient in their establishment.

As a background for their show window display of Fishing Tackle they use the rack shown in Fig. 853.

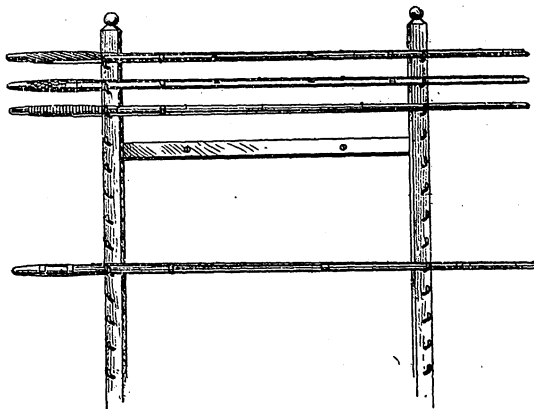


Fig. 853.—Fishing Rod Rack.

wide, dimensions in both cases being the outside measurements. As shown in Fig. 851, a strip of spring sheet brass $\frac{1}{4}$ inch in width, $2\frac{1}{4}$ inches long, is bent to the required shape and fastened at one end only by two round headed brass screws.

An ingenious method of sampling Door Knobs, as illustrated in Fig.

The uprights have nicely turned ornaments on the top and are placed 22 inches apart. Sargent's No. 70 screw hooks are placed 2 inches apart on the uprights, thus providing for a large number of Rods. In front of the rack for a base ordinary steps are used, covered with cloth, upon which small articles are displayed making an at-

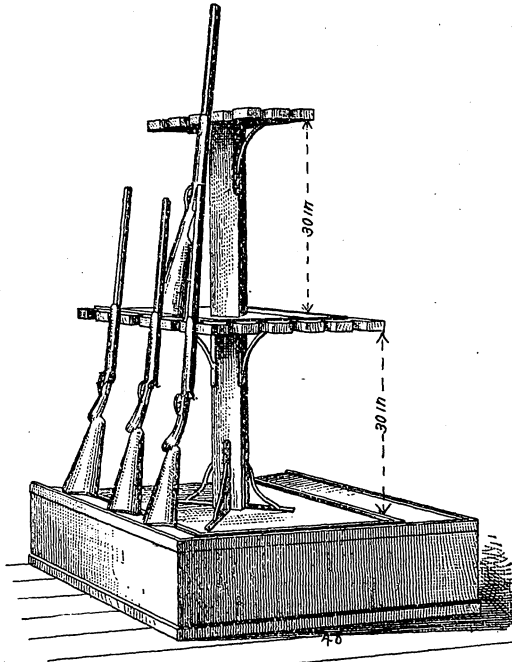


Fig. 854.—Gun and Rifle Rack.

852, enables the salesman to pull the Knob from the box instantly to show customers; it may be replaced just as quickly. To a shelf box 12 x 7 inches, $3\frac{1}{2}$ inches wide, a block is fastened. The block is $\frac{7}{8}$ inch thick, 2 inches long, and measures $\frac{5}{8}$ -inch from the back to the points where the bevel ends at the outside edges of the block. A half circle is cut in the block, and a spring of tempered steel screwed in the

tractive appearance. For Baskets, Straps, Nets, &c., screw hooks on the sides of the window are used.

The Gun and Rifle rack, Fig. 854, is 48 inches square on the base, with a 3 x 3 inch post located somewhat back from the center, to show Guns on three sides of the rack. The racks against which the barrels of the Guns rest are 30 inches apart, held in position by 10 x 12 inch iron brackets. The lower

rack is 28 x 36 inches in size and the upper one 8 x 28 inches. The rack is adapted for a square show window, and can be used for fishing tackle to good advantage. By putting screw or cup hooks around the edges it may be used out of sporting seasons for displaying Tinware and House Furnishing Goods.

Rector & Wilhelmy Co.'s Catalogue.

RECTOR & WILHELMY COMPANY, Omaha, Neb., have just issued a handsome catalogue 10½ x 13 inches in size, bound in cloth and leather, containing 1026 pages. The first pages are devoted to a view of their building, several interior views of different departments and of sample and gun rooms. These are followed by a comprehensive alphabetically arranged index covering 25 pages. For convenience the goods shown in the catalogue are distributed in departments, each department being preceded by a large engraving in which representative goods belonging to the department are artistically grouped. The departments into which the volume is divided are as follows:

- A. Mechanics' and Edge Tools.
- B. Farming Tools and Wagon Hardware, Saddlery. Furnishings and miscellaneous Hardware.
- C. Locks, Latches and Builders' Hardware.
- D. Fancy Hardware and miscellaneous Household Furnishings, Wooden Ware, Wire Goods, Hollow Ware and miscellaneous fall goods, Lamps, Lanterns, Oil Stoves, &c.
- E. Granite and Galvanized Iron Ware, Copper Ware, Japanned, Pieced and Stamped Tin Ware, Tinners' Trimmings and Metals, Metal Roofing and Tinners' Tools.
- F. Pocket and Table Cutlery, Razors, Shears and Scissors, Silver Plated Ware, Clocks, Bird Cages and Sundries.
- G. Fire Arms, Ammunition, Sportsmen's Supplies and Gun Implements, Dog Collars and Supplies, Police Goods, Tents, Wagon Covers and Fishing Tackle.
- H. Bicycles and Bicycle Sundries, Baby Carriages, Boys' Wagons, Sleighs and Skates, Base Balls and Base Ball Sundries, Hammocks, &c.

The foregoing gives an excellent idea of the large and varied lines of goods included in the catalogue. No discount sheet is issued on account of constant changing values, but quotations will be made upon application. The book is printed on a fine quality of paper, fully illustrated and substantially bound, requiring two years of continuous labor to compile it. It has been the company's aim to make the book as condensed and convenient and as comprehensive a book of reference as possible for parties who were not what might be termed thorough Hardwaremen. Particular attention has been paid to the even balancing of the pages by the use of uniform sized cuts, which has incurred additional expense; also to giving the fullest information possible regarding sizes and numbers of goods as aids in ordering intelligently.

Trade Items.

WINCHESTER REPEATING ARMS COMPANY have on exhibition at their New York store, 312 Broadway, New York, a fine example of a Yacht Cannon made by R. H. Brown & Co., New Haven, Conn., under the Lavigne patent, for the steam yacht "Dungeness" now building by the Maryland Steel Company for Mrs. L. C. Carnegie. It is mounted on a carriage of mahogany, with lignum vitæ wheels, rubber tired. The Cannon is a breech loader made of brass, takes a No. 2 Hotchkiss long shell, a little over 2 inches in diameter, and is fired by electricity.

VON LINGERKE & DETMOLD, 8 Murray street, New York, have recently been made the agents in the United States for the Walsrode Powder. This is a high grade Nitro Powder manufactured in Germany. It will be used for loading shells for shot guns only. It is represented as being entirely smokeless, very clean, with a recoil less, if anything, than the ordinary Nitro Powders, and said not to be affected by moisture or dryness.

UNITED STATES NET & TWINE COMPANY, 316 Broadway, New York, are energetically pushing the Kosmic Valise Fly Rod, recently introduced by them. In this Rod the sportsman has an article that can be carried in the pocket, short trunk or ordinary valise. It is made of split bamboo in seven joints, including extra tip; is said to be perfectly balanced and suitable for any inland fish. The Rod is 10 feet long, but may, by the use of a reducing plug, be made 8½ feet in length. It is carried in a leather case 20 inches long and weighs from 6½ to 8 ounces. The joints are all of German Silver and the Rod has an independent reversible grasp. It is retailed at \$45. In redressing their show window they have filled it entirely with a variety of Walton Rods made by them, in lengths of from 7½ to 10½ feet for different kinds of fishing, all at the uniform price of \$12.

PORTER BROS. & Co., 78 Worth street, New York, selling agents for Barnard Son & Co., have put special prices on a well assorted stock of Shears, Scissors, Button Hole Cutters, Barbers' Shears and School Scissors. They draw attention to an especially fine line of ladies' Scissors, both nickelled and japanned. The blades, they point out, are all made of Jessop's tool steel. The reason assigned for this reduction is that finding themselves with a heavy stock on hand, they have determined to make a price that will, they are confident, move the goods. They have also materially reduced the price on Barnard's Pipe Cutter.

W. A. WILLARD, long New York manager of the Lamson & Goodnow Mfg. Company, has formed a copartnership, dating from May 1, with Walter Adams, formerly in the Cutlery business at 116 Chambers street. The new firm will represent as agents the Lamson & Goodnow Mfg. Company's line of Table Cutlery, and A. F. Towle & Son Company, Sterling Silver Flat Ware and high grade Silver and Gold Plated Goods. They are now about settled in their handsome new quarters at 310 Broadway, near Duane street.

VICTOR MFG. COMPANY, Newburyport, Mass., report that they are receiving orders for their improved Balanced Fire Door from many of the large mills of Massachusetts, and that the doors are being placed in a variety of manufacturing establishments throughout the country. We are advised that this device has been approved by the Boston and New York

Board of Fire Underwriters and recommended by many mutual fire insurance companies.

FULLER BROS., 33 Chambers street, New York, selling agents for W. P. Kellogg, Troy, N. Y., are offering a new Boring Machine, made to sell at a reduced price. It is made for both straight and angular work, and numbered 1 and 3, respectively. These numbers are similar to the Nos. 2 and 5 heretofore made, except that the gauge has been omitted.

EXCELSIOR CUTLERY COMPANY, Worcester, Mass., who manufacture a line of Razors, claim to be the only factory in this country making Razors by hand. They already have a line of 60 different styles and expect soon to bring out a lot of Corn Razors. They are also putting on the market Swedish style Razors, which, they advise us, they are able to sell at a less price than they can be imported.

STANLEY RULE & LEVEL COMPANY, 29 Chambers street, New York, have hung the handsome water color of their different factory buildings at New Britain, Conn., which was a part of their exhibition at Chicago, in their New York office. It is mounted in an oak frame, 6½ x 3½ feet in size, the view being taken from across the railroad track.

THE NEW YORK OFFICE of the McDaniel & Harvey Company of Philadelphia, C. McIntosh, sales agent, has been removed from 234 Pearl street to the Downing Building, 108 Fulton street, New York. The McDaniel & Harvey Company manufacture Harvey's Patent Cleaned Sheet Iron and are sole factors for the McCullough Iron Company.

THE BOROUGH of Freemansburg, Pa., desires to purchase a combined chemical and water hand Fire Engine. Makers of such machines may address John A. Laudenberg at Freemansburg.

THE EAGLE EMERY & CORUNDUM WHEEL COMPANY, formerly at 75 and 77 West Van Buren street, have removed to the same numbers, 75 and 77, West Jackson street, Chicago. They are manufacturers of solid emery and corundum Wheels in all sizes from 3 to 36 inches in diameter. They also manufacture the Eagle Oil Stones, which are made from the best corundum and emery, which cut very rapidly and are in good demand for sharpening Bits, Chisels and all edge tools. These Stones are made with two grits, one side or face being coarse and the other fine. They are turned out in all sizes. The company also manufacture the Eagle emery and corundum Steels, 12, 14 and 16 inch, for sharpening Carvers, Scissors, &c.

THE TRADE WILL OBSERVE the advertisement on the first page in which Wilmot & Hobbs Mfg. Company, Bridgeport, Conn., and 2½ Murray street, New York, give three reasons why it pays to handle their Copperized Oilers, &c., which are stamped seamless from the company's well-known cold rolled Swedoh steel. The company also take occasion to warn the trade against cheap and inferior imitations of these goods, and intimate that they will prosecute infringement.

R. E. DIETZ COMPANY, 60 Lighthouse street, New York, and Steam Gauge & Lantern Company, Syracuse, N. Y., have had judgment entered in their favor by the United States Circuit Court of Appeals in their joint suit against the C. T. Ham Mfg. Company, Rochester, N. Y. This affirms the decree of the United States Circuit Court entered upon the decision of Judge Coxe last July. The patent in dispute relates to what is known as the Higgins

Tubular Hinged or Tilting Lantern, and grants a perpetual injunction and accounting. The companies mentioned above also have some 50 suits against dealers who have handled the goods complained of.

THE OFFICE of the Ammunition Manufacturers' Association has been removed from Temple Court to the Mutual Reserve Building, 305 to 309 Broadway, New York.

Window Display.

THE IMPORTANCE of attractive window display in connection with a Hardware store is evidently being more and more recognized, and the trade are giving increased attention to this matter. Dull times and active competition doubtless do something to stimulate efforts in this direction, as the trade find it necessary to use all legitimate methods for holding and extending their business. It is more generally conceded than heretofore that it is not necessary for a Hardware store to be the disorderly and uninviting place which it has so frequently been, and the feasibility of making it tasty, attractive and even decorative in its arrangement is being recognized. We have recently received a photograph illustrating the arrangement of the window in the Hardwarestore of Benjamin Quillman, Norristown, Pa., which gives evidence of the care and skill with which the display was arranged.

The window was draped with orange and black material; and suspended from its front and side at the top was brass chain in festoons. A board covered with black velvet was hung against the curtain at the back of the window, and on this a representation of the American eagle was arranged, measuring 3 feet 3 inches from tip to tip of wings. The eagle was composed of 12 dozen Tea Spoons, 5 dozen Table Knives, 13 Padlocks, 7 pair of Shears and 6 Saw Blades. The head and feet were of raised tin, nickel plated. A pyramid at the back corner of the window, rising about half of its height, was covered with Pocket Cutlery, Razors, Shears, Nut Cracks, Towel Holders and Key Rings, arranged in different designs. The display on the wall side of the window included Table Cutlery, Knives and Forks, bird and game Carving Sets, &c. The center piece of this design was in the shape of a fan made of Knives and Forks. The wall display was surrounded by a border of tufted material in colors. On the floor of the window were shown Carving Sets in cases, Spoons, Nickel Bells, Table Cutlery. The whole arrangement was originated and executed by the clerks in the establishment and has proved a splendid advertisement, demonstrating that window dressing plays an important part in building up a business.

Cleveland Wood Turning Company.

THE CLEVELAND WOOD TURNING COMPANY, 710 to 726 Scranton avenue, Cleveland, Ohio, are a new corporation to whom the Cleveland Window Shade Company and the late firm of Slater & Taft of Cleveland have sold their Sad Iron Handle business, together with the good will and machinery under certain letters patent for the manufacture of Circular Handles for Mrs. Potts'

Sad Irons. The new company manufacture a full assortment of regularly made Tool Handles, Mincing Knife Handles, &c., but make a specialty of Sad Iron Handles for Mrs. Potts' irons, tinned or japanned. They have brought out an improved Mrs. Potts' Sad Iron Handle No. 110, of hazelwood only, made with a steel stretcher, nickel plated, which is stated to be superior in every way to the old style iron stretcher, yet it is sold at a lower price. Careful attention is given to special orders in Handle work and all kinds of wood turning. They have in preparation a complete catalogue of their products which is promised at an early day. The officers of the company are as follows: President, C. M. Avery; vice-president, E. D. Punderson; treasurer, L. I. Pope; superintendent, J. A. Slater. Their advertisement will be found on another page of this issue.

N. R. Streeter & Co.

ATTENTION is directed to the advertisement of N. R. Streeter & Co., Groton, N. Y., manufacturers of Hardware specialties, which will be found in this issue. Some changes have been made in the affairs of this firm which are worthy of note. Their business was established in 1876. After 18 years of combined activity on the road and directing the production of goods, Mr. Streeter now gives his undivided attention to the manufacturing department. He will, however, keep in touch with his friends on the Pacific Coast by visiting that section once a year as a sort of vacation trip, which to a less active man would mean hard work. C. M. Avery was admitted to the firm in 1893 and has full charge of the sales department, with his main post office and telegraph address at Somerton, Philadelphia, Pa., a New York office at 90 Chambers street and a Chicago office at 177 Lake street. C. T. Converse, who has always conducted the main office, continues his able management. D. H. Marsh is not now actively connected with the firm, but retains his original interest, and his advice and counsel are highly valued, although his large interests elsewhere demand most of his attention. Albert H. Andrus, who has been in the firm's employ and demonstrated his capabilities, has been acting as a traveling salesman since January 1. A. G. MacAusland, who is well known to the Pacific Slope jobbers, has charge of the firm's interests west of the Missouri River to the coast. The New York office of the firm is with W. H. Jacobus, 90 Chambers street.

Protector Revolver.

THE advertisement of the Protector Revolver, which will be found in this issue, refers to a new form of Revolver illustrated a few months since in our department of Hardware novelties. It is a very small flat Revolver, which can easily be carried in the vest pocket, but holds seven shots. When it is in use it is held in the palm of the hand, and the muzzle only is seen protruding between the index and middle fingers. Improvements have been constantly made since it was first brought out in the direction of increased simplicity and safety. As made now, the weapon is very strong in all its parts and cannot be discharged except by simultaneous pressure at two points—the safety spring in front and the percussion spring in the rear. It is thus prevented from being accidentally discharged in the pocket or by falling on the floor. After each discharge it locks automatically and yet is instantly ready for service. The standard 32-caliber Cartridge is used.

Its form is such that it is highly ornamental in appearance, and it meets with favor among those who desire a weapon for defense, but object to carrying the regulation Pistol. The manufacturers are the Chicago Fire Arms Company, Rooms 437 and 438 Monadnock Building, Chicago.

Freight Charges on Export Shipments.

A TRANSACTION of interest, perhaps, to out of town manufacturers and shippers who do occasional direct export business recently came to our notice. A manufacturer in New England received an order from an English correspondent which, in shipping order, consisted of 11 cases, weighing 1486 pounds. Merchandise of this identical character had in the past regularly gone by the same line, to the same place, for the customary minimum rate at which steamer bills of lading are signed, viz., 1 guinea, or about \$5. Thinking to economize time and catch the regular weekly steamer, the goods were shipped, care of the steamship agent, without first corresponding for a rate. In the manifest for clearance at the New York Custom House the value was put at \$600 and document sent to the steamer agent. After the goods were stowed and the ship had sailed, the manufacturer received his set of bills of lading filled out at £5 sterling, or approximately \$35. Naturally he protested vigorously at such a rate, amounting to over 4 per cent. of the invoice for ocean carriage alone. In reply he received a note stating that the ship was privileged to charge any rate it chose, and if unsatisfactory, in the future shipments could take some other channel, knowing full well that any other route would be roundabout and involve railroad charges. Inquiry develops the fact that the regular rate by this line on this and similar merchandise has been and is now 17/6 per ton, ship's option weight or measurement. Therefore, had this shipment aggregated 5½ tons, it would have cost about the \$25 charged for less than ¼ ton. The excuse offered for the overcharge was that it was a small and valuable consignment, which, if any part were lost from port to port, might involve the refunding of more money than was originally received for freight. It is difficult, however, to see wherein it differed from the risks assumed by all common carriers, except when goods are sent released or owner's risk at reduced rates. Inquiry has been made of forwarders in this city having no knowledge of this transaction as to the outside cost for delivering into the consignees' possession a similar lot, with the following results: One concern doing a foreign express business would handle the shipment as *freight* from depot in New York via Cunard Line, involving railway charges for about 150 miles, covering cartages at both ends and customary incidentals, for \$12.50. Another firm similarly situated would forward by the direct line under discussion for one guinea plus the ordinary cartages, adding \$1 as their profit. A third concern offered substantially the same terms as the second.

The remedy in such cases is to solicit a rate before shipping from one or more responsible houses if practicable, giving number of cases and gross

weight, adding cubic measurement and value perhaps. If time is a consideration a rate can be sent for as soon as details are known, meanwhile shipping the goods to port of departure to shipper's order. This gives the manufacturer control of the goods while awaiting replies. When it is known to whom the shipment will be intrusted an order on the railroad, steamboat or express company can be sent the ship agent or forwarder, which will enable them to get the goods. The rapidity with which mail matter is transmitted makes the latter plan entirely feasible.

Price-Lists, Circulars, &c.

AMES SWORD COMPANY, Chicopee Falls, Mass.: Padlocks and other Hardware. An illustrated catalogue and price-list is devoted to small Padlocks for dogs and cats, perfection and trusty Key Holders, Key Guard Chains, Automatic Sash Lock, Baggage Protector, Bronze Padlocks, &c.

IDEAL MFG. COMPANY, New Haven, Conn.: Ideal hand book No. 5 of useful information for shooters. The illustrated catalogue and price-list of 80 pages shows, with descriptions, a full line of Loading Machines, Central Fire Shells, Bullet Molds, Powder Measure, &c.

I. P. FRINK, 551 Pearl street, New York: Reflectors and Reflecting Chandeliers. A pamphlet devoted to the great church light embodies information regarding the lighting of churches, halls, anterooms and public buildings by oil, gas or electricity.

NORTH BROS. MFG. COMPANY, Philadelphia, Pa.: Seasonable helps for household use. A pamphlet with this title illustrates Freezers, Ice Clipper, Ice Shave, Candlestick, Keystone Beater, Fluting Machines, Weed Faucets, Gem Cake Pan, Gem Cake and Batter Mixer, Perfection Cutter and U. S. Dial Scale.

N. R. STREETER & Co., Groton, N. Y.: Illustrated catalogue of Sad Irons and other Hardware specialties. This is a very neat publication of 40 pages, with unusually good illustrations for this class of work. The contents are of a varied character, with Sad Irons occupying the leading place. These consist of Streeter's Sensible, Mrs. Potts', the Pottstown Cold Handle, Sensible and Magic Tailors' Irons, Magic Fluting and Polishing, Double Pointed Toilet and Toy Irons, Improved Troy Polishing, Mrs. Streeter's Gem Polisher, German Tailor, New England Pressing, XX Tailor, N. R. S. & Co. Tailor, Chinese Laundry and Chinese common Irons. The Colebrookdale Iron Company's line, for which the firm are exclusive Western agents, is also shown. An attractive arrangement of Sad Irons illustrated is a case containing a set of Mrs. Potts' Cold Handle Irons, a Polishing or Toilet Iron and a girl's Iron, all nickel plated, together with the necessary handles and Iron Stands, making a full family outfit. Other articles illustrated and described are Sensible Ice Tongs, Mincing Knives, Can Openers, Ice Picks and Pulverizers, Meat Hammers, Combined Coal Shovels and Sifters, Vegetable Mashers, Extension Lamp Brackets, Combined Pot Chains and Scrapers, Rat Traps, Paper Bag and Twine Holders, Roll Paper Holders, Sash Balances, Ash Sifters, &c. The publication of this catalogue has been delayed until this time on account of many improvements which the firm have been making in their facilities during the winter and spring. Their factories are at Rochester, N. Y., and Potts-

town, Pa. The New York office is with W. H. Jacobus, 90 Chambers street.

J. R. TORREY & Co., Worcester, Mass.: Razor Stropps, &c. A 32-page illustrated pamphlet, describing the goods made by this company, including a large line of Razor Stropps, Knife Sharpeners, Removable Swivels for Barber Swing Stropps, Toilet Sets for shaving, Hones, Mugs, Soap, Nail Cutters, Key Rings, Safes for Stamps and Matches, Metal Whistles and Pocket Oilers, Soap Boxes and Mirrors, and Hair Clippers both for individuals and horses. In a separate pamphlet of eight pages they illustrate a large variety of Swing Stropps recently brought out by them.

THE GARDNER SASH BALANCE COMPANY, 312 First National Bank Building, Chicago: Illustrated circular descriptive of Gardner's Door Guard and Gardner's Sash Bolts. The Door Guard or Fast is a substitute for the chain and slide. The Sash Bolt is a substitute for the usual sash lock. These goods are referred to as of seasonable interest with the advent of warm weather, when doors and windows are left open for ventilation, but should be so secured that they cannot be opened further except from the inside. The illustrations given are of a serio comic character, showing tramps and burglars outwitted.

It Is Reported—

Connecticut.

That E. Ward Willis' Hardware and furniture store, at VOLUNTOWN, was destroyed by fire on the 24th inst.

Illinois.

That Sullivan & Church's Hardware store, at WYOMING, was buglarized a short time since.

That William Lichtenberger, Hardware merchant of SAVANNA, has sold out his stock and fixtures to H. C. Rhodes. Mr. Lichtenberger has been engaged in the Hardware business for 35 years, and his retirement is due to a desire to give his entire attention to the development of an invention which he has perfected. He has conducted a Hardware store in SAVANNA for 17 years, and prior to that time was identified with the business at SHANNON and FREEPORT. Mr. Rhodes will conduct the business under the style of the Savanna Hardware Company.

That Charles Penticoff is building a new Hardware store at PEARL CITY.

That the Hardware stock of F. M. Swing, MASON CITY, has been purchased by Layman & Brother of Chicago, who will consolidate with Paul Enlows under the firm name of Enlows & Layman and conduct the business at the Swing stand.

That Blatt Bros.' new Hardware building at ELWOOD is nearly ready for occupancy.

That S. W. Dutton's Hardware store at TOWER HILL was burned to the ground on the 18th inst.

Indiana.

That fire on the 18th inst. damaged the hardware store of Wendling & Priest, ROACHDALE.

Iowa.

That O. F. Griffith of MOUNT PLEASANT has sold his stock of Hardware to Fernald & Co., composed of W. D. Fernald and N. D. Fernald, the former of MAPLETON and the latter of CHICAGO. Mr. Griffith has not yet decided as to his future course.

That W. H. Duke & Co. have purchased the Hardware stock of McKee & Gadd, DES MOINES.

Michigan.

That a new Hardware store has been opened at UNION CITY under the firm style of Spring & Conner.

That William Urie has sold his Hardware store at BURR OAK to Mr. Bordet.

That the Gunn Hardware Company of GRAND RAPIDS have disposed of their stock to Foster, Stevens & Co. The purchase includes the entire business of the former company, both wholesale and retail. The stock will be transferred as soon as possible to Foster, Stevens & Co.'s establishment, which is large enough to amply accommodate it. It is said that the purchase price was in the neighborhood of \$125,000, and that the stock will inventory about \$150,000. The Gunn Hardware Company were a stock company with a capital stock of \$100,000, of which \$85,000 was held by W. S. and W. A. Gunn. W. S. Gunn, the founder of the business, is a wealthy man, and his object in disposing of the stock is that he may be able to devote his whole time to other more lucrative enterprises in which he is interested.

That F. W. Moon, Hardware merchant at BELLEVILLE, has sold out his business to Dodge & Spaulding of DUNDEE, who will continue it on a larger scale.

That for the past three months the Hardware store at 89 Gratiot avenue, DETROIT, owned by Geo. J. Sexauer, has been systematically robbed. On the 21st inst., however, the thief was apprehended, being caught in the act of robbery. The miscreant proved to be a former employee of the store, access being obtained by means of a false key.

Minnesota.

That the West Side Hardware Company are a new concern at NORTHFIELD.

That D. Q. Minar of WILLIAMSVILLE, N. Y., has removed his entire stock of Hardware, Tinware, &c., to ORIATT, Benzie County.

That Frank McKnight, dealer in Hardware, BUFFALO, has sold out his business.

That Miller & Nelson, Hardware merchants at WINDOM, have dissolved, Carl Nelson & Co. being successors.

That H. O. Shaw has opened a new Hardware store at SARGENT.

That W. T. Wilson & Co., Hardware merchants, WEST CONCORD, have been succeeded by C. W. Webb.

Nebraska.

That the Hardware store of C. M. Hayden, at WALLACE, was entered by burglars on May 12 and a large quantity of Cutlery, Whips, &c., taken.

New York.

That the WILLIAMSVILLE Hardware business of D. Q. Minar has been removed to ORIATT, Benzie County, Minn.

Ohio.

That Frank B. Slane, who has been traveling for the well-known firm of Howell, Gano & Co. of CINCINNATI for the past eight years, will begin a general Hardware business about August 1 at NORWOOD, where he is now erecting a new building for that purpose.

Pennsylvania.

That a handsome new front has been put in the Hardware store of Hoff & Bro., READING.

West Virginia.

That Smith & Courtwright's Hardware store at MOUNDVILLE was broken into by burglars on the 20th inst. and a large number of Razors, &c., carried off.

Wisconsin.

That James Fawcett is erecting a new Hardware store at PLATTEVILLE.

That Blasheek & Hanesworth of STODDARD are building a new store opposite their present establishment.

The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—There is nothing to note outside of the fact that trade has been extremely commonplace and that the irregularities in prices which have been a conspicuous feature for some time past continue to greater or less extent. The usual rumors of new competitors and vigorous contest of old outside, or independent, corrodors have circulation, but they have become so stale that they no longer have any effect. In any event, the best information is to the effect that buyers are operating in routine way and that sellers, while they might make some special terms where particularly desirable orders are concerned, vary little, if at all, on prices or terms where ordinary orders are concerned. The prices that ruled a week ago prevail where ordinary jobbing business is concerned.

Red Lead.—German brands for immediate and near future shipment have been offered at slightly lower prices, but the concessions are not broad enough to induce business or affect the market. American brands are, at all events, moving at about former prices, although, like nearly everything else, somewhat slower than usual at this season of the year. The market is soft, but no worse at the present time than it was a week ago. In fact, there is hardly enough business to fairly determine the status of the market.

Litharge.—Sales of the low grades have fallen off somewhat, and it looks now as though the larger consumers have provided for probable wants at least 60 days ahead. In the high grades used in the Paint trade only a moderate business has been done, but the bulk of it was at old prices.

Orange Mineral.—Nothing really new has occurred the past week. Only a moderate business is reported for spot goods, and few buyers are anticipating future wants pending the tariff legislation. French is held somewhat firmly at full former rates. German and English are quiet. American is meeting with the usual sale in small quantities.

Zincs.—The market for American Oxide is exceedingly flat. Barely the average deliveries are making on old contracts and new orders are almost invariably small as well as few. Still it is claimed that sellers are adhering to former prices.

Colors, &c.—No new changes in prices of Dry Colors have been announced, nor is there anything interesting in the character or volume of business. Everything is commonplace at the moment. Oil Colors and ready mixed Paints have had slow sale, owing in part to unfavorable weather for outdoor work.

Oils and Turpentine.

Linseed Oil.—Little or nothing has been done outside of routine business. Large consumers are well stocked and have enough Oil due on contract to cause them to feel easy about the near future, since corrodors have made no move calculated to unsettle confidence. That there is enough Raw Oil to go around is plain, however, and there is room for suspicion that the late reduction on Calcutta seed product means more than has been told up to the present time. In this connection, however, it may be remarked that the differences

between the large producers and the minority have not been completely healed. Affairs have appeared as serene before.

Cotton Seed Oil.—Extreme dullness is the one feature of the market during the week under review. Various explanations have been given. They were explanations that failed to convey the right idea. It is simply the case that buyers had few or no orders at sellers' figures and that sellers did nothing to expedite business. It is not exactly a stubborn contest yet, in the ordinary sense of the term, but has features indicating that buyers are bound to lose no advantage, however confident the opposition may be.

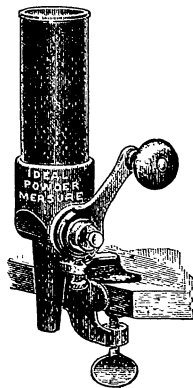
Lard Oil.—Prime quality has been sold at as low as 59¢. The popular quotation is now 60¢ upward, and some sellers name as high as 62¢. It is safe to say that any price above 60¢ is exceptionally high and merely a quotation in the strict meaning of the term. The buying has been slow and hesitant. The demand is extremely flat.

Fish Oils.—Little has been done in crude Sperm, Whale or Menhaden Oils, and prices stand just about as they were last week in the absence of new moves by holders or change in the character of home trade or export demand. The Pressed and Bleached Oils find fair sale in small lots at former prices.

Spirits Turpentine.—Prices have ruled remarkably steady; so much so, in fact, that slightly better Southern advices served to turn the market slightly for the better. Spot business was done at 30¼¢ for regular and 30¾¢ for machine barrels.

The Ideal Universal Powder Measure.

Ideal Mfg. Company, New Haven, Conn., are introducing the powder measure shown in the accompanying cut. It is explained that the range of the measure is from a 0.22-caliber up to an 8-gauge shot shell, and that it will



The Ideal Universal Powder Measure.

handle all varieties of powder now made. The measure can be clamped on a table or bench and, it is stated, is operated with an entire absence of tipping over or spilling powder, and that there is no dipping and striking off measure. It is operated by turning the crank, the delivery being free and opening directly from the bottom of the reservoir to the measure. The manufacturers guarantee that when the measure is correctly set there will not be a variation of 1 grain in loading 10,000 shells.

Boss Instantaneous Mending Cones.

P. D. Murphy, Lockport, N. Y., is offering cones for mending, as illustrated herewith. The metallic cones are a little larger than the one shown to the right of the inverted pan in the cut, and are designed to be riveted into the holes of the article to be mended. The cones are adapted to mending tin, sheet iron, copper and

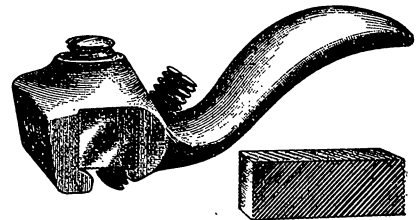


Boss Instantaneous Mending Cone.

agate ware without fire, solder or acids. The cones are put up in cylinder shaped wooden boxes.

Electric Lawn Mower Sharpener.

Troy File Works, Troy, N. Y., for whom George M. Matteson, 111 Chambers street, New York, is agent, are introducing the lawn mower sharpener illustrated herewith. It consists of a bronze metal handle holding a four-square file. The file is held in place by the set screw on the top, while the set screw at the side is adjustable to the bevel of the blade. The detached file is shown at the right of the sharpener, having the four sides cut for use. The point is made that eight surfaces are available for use, as but half of any face comes in contact with the blade at one time. While the sharpener is designed



Electric Lawn Mower Sharpener.

for lawn mowers, it is explained that it is equally useful for sharpening shears, scissors, tobacco knives or any thing with a short bevel.

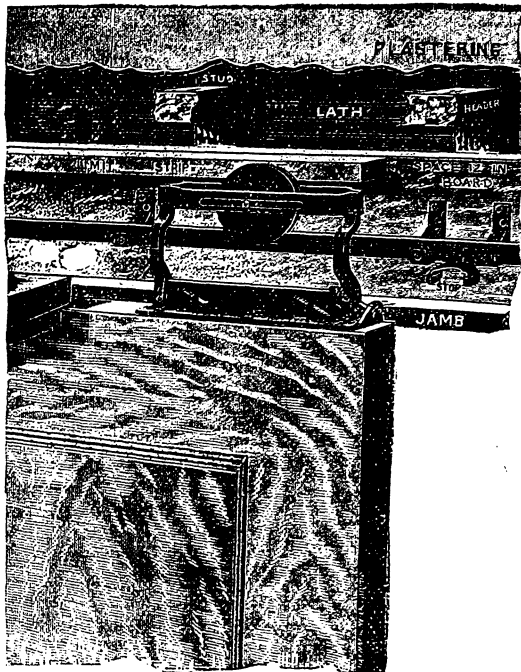
Erie Aluminum Hollow Ware.

Griswold Mfg. Company, Erie, Pa., have added to their line of extra finished hollow ware, tea kettles and preserving kettles cast in pure aluminum. The tea kettles are cast all in one piece, having no spout to melt off, no seams to open and no chance for leakage. The manufacturers state that pouring cold water into them when hot will not injure them, that they will not melt on the stove, and that water boils in the aluminum kettle in one-third less time than in tin or copper. The preserving kettle is cast in 4, 6 and 8 quart sizes, with a rim on the bottom to equalize the heat and to prevent burning. The manufacturers claim for the kettles that acids will not affect them, that there is no enamel to flake off or plating to wear off, and that oatmeal, rice, puddings, &c., can be cooked in them without scorching. The point is made that the kettles will not tarnish or corrode, and that they are stiff, firm and indestructible.

Economy Steel Single Track Parlor Door Hanger.

In the accompanying cut is shown a steel single track parlor door hanger introduced by the Economy Mfg. Company, Syracuse, N. Y. The cut illustrates one of a set of double doors, with

ber tappet fastened to one of the spokes of the wheel. The manufacturer states that it is positively and absolutely sure in its action, every revolution of the wheel registering; that it will register 10,000 miles and repeat; that it is always in sight and out of the way; that it is legible and easily read from the saddle; that it is constructed mainly for

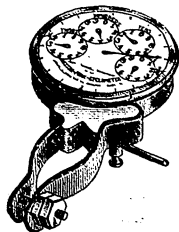


Economy Steel Single Track Parlor Door Hanger.

the plastering above cut away to show the track and manner of hanging. It is remarked that the hangers are strongly made of high grade steel and are calculated to carry the heaviest doors. The track is of heavy steel and of an improved bracket construction. The wheels, it is stated, are of an original design provided with a tread of fiber to render the wheels noiseless, especially made for the purpose and absolutely indestructible. Attention is called to the overhead gravity stop, which, it is explained, is very simple and efficient and dispenses entirely with screws and labor in applying. For hanging, a clear space of 4 inches is required between the two lines of studding. The hangers are lacquer finished, the track is japanned and the hangers are packed with screws complete for putting them up.

Weston Fork Cyclometer.

Frank C. Weston, Bangor, Maine, is offering the cyclometer here shown, with improvements for 1894. The



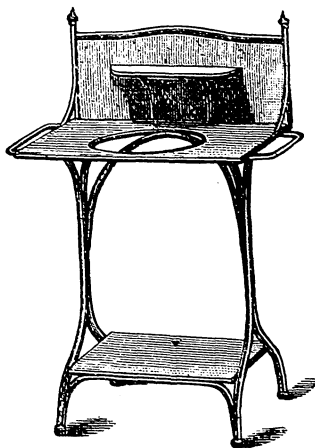
Weston Fork Cyclometer.

cyclometer is described as weighing less than 5 ounces, adjusted for pneumatics and attached anywhere on the left front fork of a wheel above or below the foot rest. The device is actuated by a rub-

ber tappet fastened to one of the spokes of the wheel. The manufacturer states that it is positively and absolutely sure in its action, every revolution of the wheel registering; that it will register 10,000 miles and repeat; that it is always in sight and out of the way; that it is legible and easily read from the saddle; that it is constructed mainly for

Japanned Toilet Stand.

The accompanying illustration represents a metal toilet stand put on the market by Lalance & Grosjean Mfg.



Japanned Toilet Stand.

Company, 19 Cliff street, New York. Made of sheet steel, the stand is light, yet durable, and is specially adapted to country house or camp use. It is japanned of an ivory white color, resembling enamel, and is easily kept clean, presenting at all times a neat and tidy appearance. It is fitted for the accommodation of all the toilet requisites, and possesses the additional recommendation of economy of space, being but 42 inches high and 30 inches wide.

Double Tank Thermometer Churn.

R. M. Ball, Muncie, Ind., is offering the double tank churn shown in the accompanying illustrations. The churn consists of a vertical dasher with a rotary reciprocating motion and two detachable cylindrical tanks, one of



Fig. 1.—Double Tank Thermometer Churn.

heavy cross tin inserted inside of and resting with its upper rim or flange upon the wooden tank, the inner one of which forms the cream containing vessel, as shown in Fig. 2. The space between the tanks is filled with water, allowing the operator to control the temperature of the cream by pouring either hot or cold water into the tube

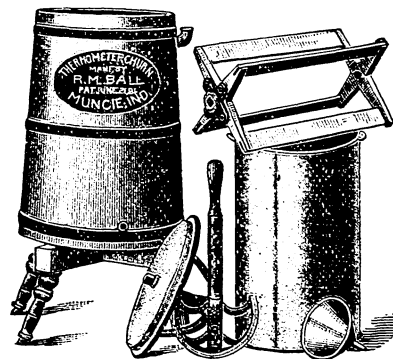


Fig. 2.—Parts of Double Tank Churn.

near the top of the outer tank by the aid of the funnel. Thus the temperature of the cream can be changed in a moment without adulterating it with water. The churn has an indicator in the cover to enable the operator to tell when butter comes, and also to give perfect ventilation. The manufacturer claims that with the churn butter can be made out of any cream, sweet or sour, in from 2 to 20 minutes; that the churn is easily taken apart and cleaned; that there is nothing about it to wear out or to get out of repair; that 1 quart of cream can be churned as well as 4 gallons, and that there is no slopping or dripping of the cream.

Hunting and Fishing Lamp.

R. E. Dietz Company, 60 Laight street, New York, are bringing out an improved hunting and fishing lamp. It is 11½ inches high and 6 inches is the greatest diameter. In the center is a conical reflector, which, it is said, throws light 200 to 300 feet. The front has a round beveled glass, 5½ inches in diameter, protected by a hinged cap which shuts off all light when necessary. The whole lamp is nicely japanned.

Climax and Premium Watches.

Robert H. Ingersoll & Bro., 65 Cortlandt street, New York, are introducing an improved form of watch, as shown in

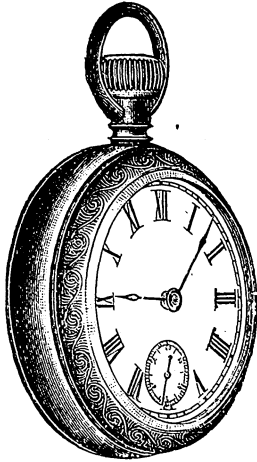


Fig. 1.—Climax Stem Winder with Inside Stem Set.

the accompanying illustrations. The manufacturers explain that they have succeeded in making the movement much smaller and more compact than heretofore. The Climax stem winder, with inside stem set, shown in Fig. 1, is referred to as a regular American lever, lantern steel pinions, 240 beats

per minute, three-quarter plate, with dust cap over movement, and runs 30 hours with one winding. This watch is 2½ inches in diameter and weighs 3¼ ounces. In Fig. 2 is shown the Premium watch, which has an inside wind, but is quite similar in other respects, except that it is a little larger in size, being offered at a less price. The watches are made in a number of styles and finishes, including nickel, gilt and black satin cases, and are fully warranted

holders are made of leather for fastening to bicycles. The holders are made in both black and russet leather. All of the goods described above are intended largely for the hardware trade. The Climax stem winder retails at \$2 each, and is offered to the trade at \$15 per dozen. The Premium watch retails at

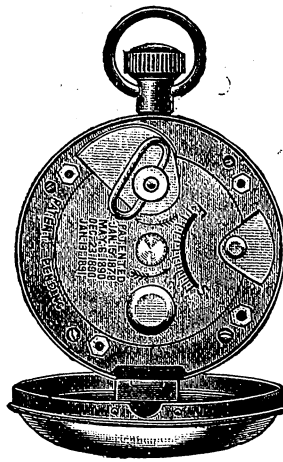


Fig. 2.—Premium Watch with Short Inside Wind.

holders are made of leather for fastening to bicycles. The holders are made in both black and russet leather. All of the goods described above are intended largely for the hardware trade. The Climax stem winder retails at \$2 each, and is offered to the trade at \$15 per dozen. The Premium watch retails at

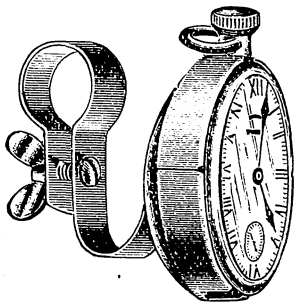


Fig. 3.—Nickel Brass Holder for Bicycles.

per minute, three-quarter plate, with dust cap over movement, and runs 30 hours with one winding. This watch is 2½ inches in diameter and weighs 3¼ ounces. In Fig. 2 is shown the Premium watch, which has an inside wind, but is quite similar in other respects, except that it is a little larger in size, being offered at a less price. The watches are made in a number of styles and finishes, including nickel, gilt and black satin cases, and are fully warranted

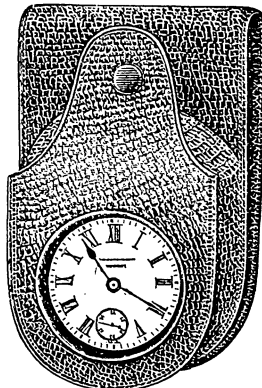
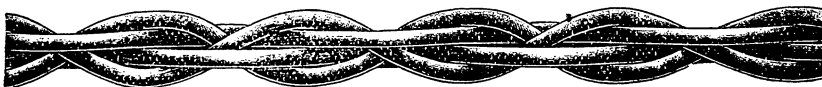


Fig. 4.—Leather Dash Watch Holder.

\$1.50 each, and can be bought at \$12 per dozen.

Monarch Braided Wire.

The accompanying cut represents Monarch fence wire, offered by the Wire Fence Supply Company, Indianapolis, Ind. The wire is made of four strands of No. 14 galvanized steel wire, although it may be ordered of special



Monarch Braided Wire.

to run within a minute a week. The dials are either Roman or Arabic. A feature is made of furnishing, at a slight increase in cost, a large variety of chains, making a complete outfit. Fig. 3 illustrates a holder made of spring

sizes for special purposes. The manufacturers claim that the wire is strong, easily seen by stock, harmless as a plank; that it will not cramp or strain at any point, as it has no twisted parts; that it is so braided that it will not

stretch or sag, that it is easily handled, that it does not kink, that it is easily spliced and that it runs 14 feet to the pound. The manufacturers guarantee the wire not to break by contraction in cold weather, as it provides within itself for changes of temperature, and yet that it is elastic. The wire is designed for all styles of farm and lawn fencing, for park purposes, for holding up woven wire, clothes lines, &c. The point is made that it comes within the range of a reasonable priced all around general purpose wire. The company send samples to the trade, free of expense, upon request.

Ladder Skate.

Specialty Mfg. Company, Titusville, Pa., are offering a ladder skate, as here shown. The bottom of the skate is provided with a three-loop casting to

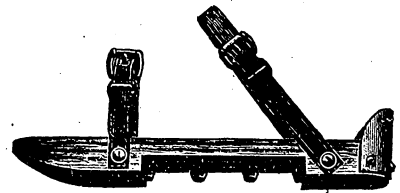


Fig. 1.—Ladder Skate.

prevent slipping on the round of a ladder. The manufacturers state that the skates can be put on or taken off in an instant; that they do not have to be taken off when walking on the ground; that by their use standing on the round of a ladder is made as comfortable as

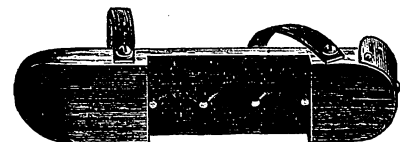


Fig. 2.—Bottom of Ladder Skate.

standing on the ground, and that the skates are so made that the foot can be moved on a ladder to any desired position. The skates are designed for the use of tanners, painters, fruit growers and others who use ladders. The point is made that the skates are great savers of shoes.

Acme Sash Cord.

The Coiled Wire Belting Company, 40-42 Noble street, Jersey City, N. J., are offering a coiled steel wire spring sash cord. This, it is stated, is so closely and rigidly coiled as to have the resistance necessary to sustain a sash of 60 pounds or less. It is explained that the cord has a stretching capacity of about 5 per cent., which enables the sash to rest easily and lightly on the pulleys, and causes the sash to be raised or lowered with half the effort required with sash cord. The manufacturers state that they guarantee it to give satisfaction, and warrant it for five years, and that it is nearly as cheap as rope and at least 20 times as durable. Nos. 1, 2, 3 and 4 are recommended to carry sash up to 15, 25, 40 and 60 pounds respectively. The cord is made in two styles, coppered and tinned, and is fastened at the ends by means of screw eyes which are cut to take the thread of the coil.

MAY 29, 1894.

The character **2** is used to indicate a range of price thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Chalk Lines—See Lines.

Checks, Door—
Bardsley's.....20%
Unity.....50%

Chisels—
Socket Framing and Firmer
Mfg. Co.....75¢ to 80¢
P. S. & W.....
Witheyby.....
Buck Bros.....30%
Charles Buck.....
Douglass.....75¢ to 75¢ 10¢
Merrill.....60¢ to 60¢ 10¢
L. & J. White.....30¢ to 30¢ 5¢
Tanged and Miscellaneous.
Buck Bros.....30%
Charles Buck.....30%
Butchers.....\$4.75 to \$5.00 to 2
Spear & Jackson's.....\$5 to 2
Tanged Firmer.....50¢ to 50¢ 10¢
L. & J. White, Tanged.....25¢
Cold Chisels, fair quality, # 14 to 16¢

Chisels—
Beach Pat.....each, \$8.00.....20%
Danbury.....each, \$8.00, 30¢ to 30¢ 5¢
Graham Patent.....33¢
Morse's Adjustable, each, \$7.00, 20¢ to 20¢ 5¢
Syracuse, Balz Pat.....25%
Skinner Patent Chisels.....40%
Combination Lathe Chisels.....25%
Drill Chisels.....25%
Independent Lathe Chisels.....40%
Planer Chisels.....20%
Universal Lathe Chisels.....40%
Union Mfg. Co.....40%
Combination.....40%
Independent.....40%
Universal.....40%
Victor.....\$8.50, 25%

Churns—
McDermid Star Barrel Churn, each
6 gal., \$2.60; 10 gal., \$2.75; 15 gal.,
\$3.00; 20 gal., \$3.25.
Tiffin Union, each, 5 gal., \$3.25; 7 gal.,
\$3.75; 10 gal., \$4.25.

Clamps—
Adjustable, Cincinnati.....15¢ to 15¢
Adjustable, Cincinnati.....15¢ to 15¢
Adjustable, Cincinnati.....15¢ to 15¢
Barnes' Machinists' Clamps.....33¢
Cabinet, Sargent's.....70¢ to 70¢
Carpenter's, Cincinnati.....25¢ to 25¢
Carriage Makers', P. S. & W. Co.....40¢ to 40¢
Carriage Makers', Sargent's.....75¢ to 75¢
Eberhard Mfg. Co.....40¢ to 40¢
Joiners' Clamps, Tatum's.....25¢ to 25¢
R. I. Tool Co.'s Wrought Iron.....25%
Saw Clamps, see Vises, Saw Filers'
Stearns' Malleable, with Wrought Iron
Screw.....75¢ to 75¢ 5¢
Warner's.....40¢ to 40¢ 10¢ 5¢

Clamps—
Beatty's.....40¢ to 40¢ 10¢
Bradley's.....25¢ to 25¢
Foster Bros.....40%
New Haven Edge Tool Co.'s.....40%
Nichols Bros.....30%
P. S. & W.....33¢ to 33¢ 5¢
Schulte, Lohr & Co.....40¢ to 40¢ 5¢
L. & J. White.....25%

Clamps—
Baker Axle Clips.....25%
Norway, Axle.....65¢ to 65¢ 5¢
Norway Spring Bar Clips.....65¢ to 65¢ 5¢
2d grade Norway Axle.....70%
Steel Felloe Clips.....# 1, 4¢
Superior Axle Clips.....70%
Wrought Iron Felloe Clips.....# 1, 5¢ 4¢

Cloth and Netting, Wire
—See Wire, &c.

Cocks, Brass—
Hardware List (Globe, Kerosene, Lever
Bibbs, Racking, &c.).....60¢ to 60¢ 10¢
Coffee Mills—See Mills, Coffee.

Collars, Dog—
Brass, Pope & Stevens' List.....40%
Chapman Mfg. Company, new list.....40%
Embossed, Gift, Pope & Stevens' list 30¢ to 30¢
Leather, Pope & Stevens' list.....40%
Medford Felt Good Co.....40¢ to 40¢ 5¢
Combs, Curry—
American Curry Comb Co.....33¢ to 33¢ 4¢
Fitch's.....50¢ to 50¢ 10¢ 5¢
Gibbs' Magnetic.....# 1, 20¢
Kohler's Humane.....# 1, 17¢
Kohler's Magic Oscillating.....# 1, 25¢
Rubber, per doz., \$10.00.....25%

Compasses, Dividers &c.
Compasses, Calipers, Dividers.....70¢ to 70¢ 5¢
Bemis & Call Co.'s
Dividers.....
Calipers, Call's Patent Inside.....55%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
Excelsior.....50%
Starrett's
Combination Dividers.....25%
Lock Calipers and Dividers.....25%
Spring Calipers and Dividers.....25% to 25% 10¢
Stevens & Co.'s.....25% to 25% 10¢

Coilers, Water—
2 Co., 6 gal., \$3.40; 9 gal., \$4.00;
4 Co., 12 gal., \$5.60 each.....60%
Coopers' Tools—
See Tools, Coopers'.

Cord—Sash—
Braided, Crown Drab and Fancy, # 30
1, 55¢.....
Braided, Crown White, # 1, 50¢.....
Cable Laid Italian Sash.....# 1, 19¢ to 19¢
Common.....# 1, 8¢ to 8¢
Common Russia Sash.....# 1, 12¢ to 12¢
Egyptian, India Hemp, Braided.....# 1, 26¢
India Cable Laid Sash.....# 1, 11¢ to 11¢
Massachusetts, White.....# 1, 22¢ to 22¢
Ossawa Mills—
Braided, Giant, Drab and Fancy, # 1
1, 55¢.....
Braided, Giant, White, # 1, 30¢.....
Patent, good quality.....# 1, 10¢ to 10¢
Patent Russia Sash.....# 1, 13¢ to 13¢
Samson—
Braided, Drab Cotton.....# 1, 42¢
Braided, Italian Hemp.....# 1, 40¢
Braided, Linen.....# 1, 58¢
Braided, White Cotton.....# 1, 37¢
Semper Idem, Braided, White.....# 1, 26¢
Silver Lake—
A quality, Drab, 55¢.....25%
A quality, White, 50¢.....25%
B quality, Drab, 35¢.....10%
B quality, White, 30¢.....10%
Cyan Spring, Extra Braided, Drab, 39¢
Cyan Spring, Extra Braided, White, 34¢
Tate's Solid Braided—
Economy, Drab.....# 1, 27¢
Economy, White.....# 1, 22¢

Hercules, Drab.....# 1, 30¢
Hercules, White.....# 1, 25¢
White Cotton Braided, fair.....# 1, 25¢ to 25¢
Wire Picture—
Braided or Twisted.....30¢ to 30¢ 15¢
Corkscrews—See Screws, Cork.
Corn Knives and Cutters
—See Knives, Corn.

Crackers, Nut—
Acme.....
Japanned, # gro., \$30.....50%
Nickel Plated, # gro., \$30.....40%
Table (H. & B. Mfg. Co.).....40%
Turner & Seymour Mfg. Co.....50%

Cradles—
Grain.....50¢ to 50¢ 5¢ 2¢
Crays—
White Crays, # gross.....6¢ to 6¢ 1¢
Cases, 100 gr., \$3.75 to \$4.25, at factory.
D. M. Steward Mfg. Co.:
Metal Workers', # gross, \$2.50, 20¢ to 25%
Railroad, # gross, 2.00, 20¢ to 25%
Rolling Mill, # gross, 2.50, 20¢ to 25%
Soapstone Pencils, # gross, 1.50, 20¢ to 25%
See also Chalk.

Creamery Pails—See Pails, Creamery.
Crow Bars—See Bars, Crow.
Curry Combs—
See Combs, Curry.

Cutters—
Meat—
American.....1 2 3 4 B 5 30%
Nos.....1 2 3 4 B 5 30%
Each.....\$5 \$7 \$10 \$25 \$50 \$80
Enterprise.....25%
Nos.....10 12 22 32 43
Each.....\$3 \$2.50 \$4 \$8 \$16
Dixon's, # doz.....40¢ to 40¢ 5¢
Nos.....\$14.00 \$17.00 \$18.00 \$30.00

Draw Cut, each:
Nos. 5 2 6 8
\$50 \$75 \$80 \$225.....20¢ to 25%
Hale's, # doz.....1 12 13
Nos.....\$27.00 \$33.00 \$45.00
Home No. 1, # doz.....\$55 to 55¢ 10¢
Little Giant, # doz.....40¢ to 40¢ 5¢
Nos. 305 310 312 320 322
\$35.00 \$48.00 \$44.00 \$72.00 \$68.00
Miles' Challenge, # doz.....45¢ to 45¢ 10¢
Nos.....\$22.00 \$30.00 \$40.00 \$40.00
Triumph No. 505, # doz.....\$21.00, 25¢ to 30¢
Woodruff's, # doz.....40¢ to 40¢ 5¢
Nos.....100 150
Chadborn's Smoked Beef Cutter, # doz.....\$60.00
Enterprise Beef Shavers.....20%

**Tucker & Dorey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife, # gross.....\$21.00
Slaw Cutters, 2 Knife, # gross.....30.00**

Tobacco
Acme.....# doz., \$20.00, 40%
All Iron.....# doz., \$4.25
Champion.....# doz., \$2.00, 50%
Kashua Lock Co.'s.....# doz., \$18.00, 50¢ to 55¢
National.....# doz., \$21.00, 30%
Sargent's.....# doz., \$24.00, 55¢ to 60%
Washer—
Appleton's.....# doz., \$18.00, 60¢ to 10%
Bonney's.....# doz., 30¢ to 10%
Cincinnati.....# doz., 25¢ to 10%
Johnson's.....# doz., \$11.00, 35¢
Ryan's, # doz., \$14.15, 35¢
Smith's Pat.....# doz., \$12.00, 20¢ to 10%

Diggers, Post Hole, &c.
Cronk's Post Bars, # doz.....\$80.00,
50¢ to 50¢ 10%
Eureka Diggers.....# doz., \$10.50, 50¢ to 12¢
Fletcher Post Hole Augers, # doz.....\$38.00,
20¢ to 20¢ 10%
Gem, Improved, # doz., \$9.00, 40¢ to 10%
Gibbs' Columbia.....# doz., \$12.00,
Gibbs' Hustler.....# doz., \$10.00,
Gibbs' Imperial.....# doz., \$7.50,
Gibbs' National.....# doz., \$12.00,
Gibbs' Post Hole Digger.....# doz., \$12.75,
Kohler's Hercules.....# doz., \$14.00,
Kohler's Invincible.....# doz., \$12.00,
Kohler's Little Giant.....# doz., \$18.00,
Kohler's New Champion.....# doz., \$8.00,
Ryan's.....# doz., \$20.00, 10%
Samson.....# doz., \$34.00, 25¢ to 25¢ 10%
Schneider.....# doz., \$18.00,
Shimer's Hollow Handle.....# doz., \$24.00,
Vaughan's Post Hole Auger, # doz.....\$8.50 to \$9.50

Dividers—See Compasses.
Dog Collars—See Collars, Dog.
Door Checks—
See Checks, Door.
Door Springs—
See Springs, Door.
Drawers, Money—
Money Drawers, # doz.....\$18 to \$20
Wadell's Improved, No. 1, # doz.....\$15.00
Wadell's Improved, No. 2, # doz.....\$18.00
Wadell's Comb, Cutlery Case and
Alarm Till.....\$12.50

Drawing Knives—
See Knives, Drawing.
Drills and Drill Stocks—
Automatic Boring Tools.....\$1.75 to \$1.85
Bench Drill Stearns.....each 50%
Blacksmiths.....each 17%
Blacksmiths' Self-Feeding, each \$7.50, 20%
Breast, Bartholomew's.....each \$2.50
Breast, Millers Falls.....each \$3.00, 25%
Breast, P. S. & W.....40¢ to 40¢ 10%
Breast, Wilson.....30¢ to 30%
Chicopee Automatic Drill.....20¢ to 10%
Goodell Automatic Drills.....40¢ to 40¢ 10%
Ratchet, Curtis & Curtis.....30%
Ratchet, Ingersoll's.....25%
Ratchet, Merrill's.....20¢ to 20¢ 5¢
Ratchet, Moore's Triple Action.....25¢ to 30%
Ratchet, Parker's.....20¢ to 20¢ 5¢
Ratchet, Weston's.....20¢ to 25%
Ratchet, Whitney's.....20¢ to 10%
Whitneys Hand Drill, Plain, \$11.00,
Adjustable, \$12.00.....20¢ to 10%

Twist Drills—
Cleveland.....50¢ to 50¢ 10%
Diamond, W. & B.....50¢ to 50¢ 10%
Graham's Fat Groove Shank.....50¢ to 50¢ 10%
New Process.....50¢ to 50¢ 10%
Standard.....50¢ to 50¢ 10%
Syracuse (Metal list).....50¢ to 50¢ 10%

Drill Bits or Bit Stock

Drills—See Augers and Bits.

Drill Chucks—See Chucks.

Dripping Pans—
See Pans, Dripping.

Drivers, Screw—

Allard's Spiral, new list.....25%
Brace Screw Drivers.....25¢ to 10%
Buck Bros.....30%
Buck Bros' Screw Driver Bits.....27¢ to 27¢
Clark's Pat.....33¢ to 40%
Cincinnati.....25¢ to 10%
Champion.....25¢ to 10%
Diston's.....50%
Douglass Mfg. Co.....30¢ to 20¢ 10%
Ellrich's Socket and Ratchet.....25¢ to 25¢ 10%
Gray's Hol. H. dle Sets.....No. 5, \$12.00, 45%
Gay & Parsons.....35%
Goodell's Automatic.....50¢ to 50¢ 5¢
Knapp & Cowles.....70¢ to 10%
No. 1.....70¢ to 10%
No. 2.....70¢ to 10%
No. 3.....80¢ to 10%
No. 4 and 00, Acme and Ideal.....60¢ to 10%
Kolb's Common Sense.....# doz., \$8.00, 25% to 10%

Mayhew's Black Handle.....50%
Mayhew's Monarch.....45¢ to 10%
P. S. & W.....70%
Sargent & Co.'s.....60¢ to 10%
Nos. 20, 40 and 60 wdr Bits.....\$3.25
Screw Driver Bits, Parr's.....\$3.25
Screw Driver Bits.....# doz., 50¢ to 75¢
Stanley R. & L. Co.'s
No. 64, Varnished Handles.....65¢ to 10%
No. 88.....70¢ to 10%
Syracuse.....25¢ to 10%
Syracuse.....30¢ to 30¢ 5¢
C. T. Williamson Wire Novelty Co.....50%

Egg Beaters—See Beaters, Egg.
Egg Poachers—
See Poachers, Egg.

Electric Bell Sets—
See Bells, Electric.

Emery—No. 4 to No. 54 to Flour, CF
48 gr. 150 gr. F.F.F.
Kegs, # 1.....4 1/2¢
2.....5¢
3.....5 1/2¢
4.....5 1/2¢
5.....5 1/2¢
6.....5 1/2¢
7.....5 1/2¢
8.....5 1/2¢
9.....5 1/2¢
10.....5 1/2¢
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45.....5 1/2¢
46.....5 1/2¢
47.....5 1/2¢
48.....5 1/2¢
49.....5 1/2¢
50.....5 1/2¢
51.....5 1/2¢
52.....5 1/2¢
53.....5 1/2¢
54.....5 1/2¢

Enameled and Tinned Ware—See Ware, Hollow.
Escutcheon Pins—
See Pins, Escutcheon.

Escutcheons—
Brass Thread.....60¢ to 60¢ 10%
Door Lock.....Same dis. as Door Locks.
Wood.....25%

Expanded Metal—
List No. 5.
Door Mats, Galvanized.....25%
Fencing, Painted Sheets.....20%
Lathing.....10%
Netting, Painted Sheets.....20%
Tree Guards, Panoled.....15%
Window Guards, Panoled.....15%

Extractors, Lemon Juice
—See Squeezers, Lemon.

Fasteners, Blind—
Austin & Eddy, # gr. sets.....\$5.50
Mackrell's, # doz., \$1.00.....20¢ to 20¢ 10%
Security Gravity.....# gr., \$7.50
Van Sand's Old Pat., \$15 # gr.....55¢ to 10%
Van Sand's Screw Pat., \$15 # gr.....60¢ to 10%
Zimmerman's.....50¢ to 10%

Faucets—
B. & L. B. Co.:
Burnside's Lock, Open and Shut Key.....50%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl. lots.....50% to 10%
Cork Lined.....70¢ to 70¢ 10%
Fenn's.....40%
Fenn's Cork Stops.....35¢ to 40%
Frary & Pat. Petroleum.....60%
Metallic Key, Leather Lined.....60¢ to 60¢ 10%
National Measuring, # doz., \$36.00, 25¢ to 10%
John Sommers'.....
Peerless Best Block Tin Key.....40%
IXL, lat quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection Fla. Red Cedar (in boxes) 40%
Boss Metallic Key.....80%
Reliable Cork Lined.....80%
O. K. Western Pattern Cork Lined.....50%
No Brand, Red Cedar (in bbls.).....50¢ to 10%
Western Pattern Metal Key.....40%
No Brand Metal Key.....60%

Self-Extractor, # doz., \$36.00.....25¢ to 10%
Lane's # doz., \$36.00.....25¢ to 10%
Star.....60%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list.....60%

Felloe Plates—
See Plates, Felloe.
Fibre Ware—See Ware, Fibre.
Fifth Wheels—
Brewster.....50¢ to 50¢ 5¢
Dey and Cincinnati.....45¢ to 5¢

Files—Domestic—
American.....70¢ to 70¢ 10%
Arcade.....60¢ to 60¢ 10%
G. & H. Barnett (Black Diamond).....60¢ to 60¢ 10%
Eagle.....60¢ to 60¢ 10%
Nicholson Files, Rasps, &c. 60¢ to 60¢ 10%
Nicholson (X.F.) Files.....25%
Nicholson's Royal File (See above).....75%
(extra prices on certain sizes)
Other makers, best brands.....70¢ to 70¢ 10%
Fair brands.....75¢ to 75¢ 5¢
Second quality.....80¢ to 80¢ 10%
Arcade Horse Rasps.....50¢ to 50¢ 10%
Chelsea Horse Rasps, Hand Cut.....50¢ to 50¢ 10%
Heller's Horse Rasps.....50¢ to 50¢ 10%
McCaffrey's Horse Rasps.....50¢ to 50¢ 10%
Trojan Horse Rasps.....60¢ to 60¢ 10%

Imported—
Butcher.....Butcher's list, 20%
Stubbs' list 25¢ to 25%

Fixtures Grindstone—

Moore's.....55%
P. S. & W. Co.....50¢ to 10%
Reading Hardware Co.....80¢ to 10%
Sargent's Patent.....70¢ to 10%

Fluting Machines—
See Machines, Fluting.

Fodder Squeezers—
See Squeezers, Fodder.

Forks—
Hay, Manure, &c. Asso. List, 70¢ to 70¢ 5¢
Hay, Manure, &c. Phila. List, 60¢ to 60¢ 10%
Plated, see Spoons.

Frames—Saw—
Red, Polished and Varnished.....# doz.,
White Vermont.....# gro., \$9.00, 10¢ to 10¢
Screen, Window and Door—
Bonanza Window Screens.....50¢ to 10%
Corland.....40¢ to 40¢ 5¢
Empire Fancy Screen Doors, # doz.....\$13
Phillips' Window Screen Frames.....50¢ to 50¢ 10%
Porter's Pat. Window and Door Frame.....33¢ to 33¢ 10%
Stearns' Frames and Corners.....25¢ to 25¢ 10%
Wabash Adjustable Window Screen.....40% to 5%

Freezers, Ice Cream—
American.....60%
Arctic.....70%
Billard.....70%
Boss and Pet.....60¢ to 60¢ 10%
Buffalo Champion.....65%
Confectioners' Machine.....50%
Crown.....60%
Double Action Crown.....60%
Giant.....65%
Good Luck.....65%
Granite State.....65%
Keystone, P. D. & Co., each, \$1.50, 20%
Model.....60%
Ohio.....60¢ to 10%
Perseus.....60¢ to 10%
Shepard's Lighting.....60%
Standard.....60%
Standard Double Action.....60%
Star.....60%
White Mountain.....60%
Zero.....70%

Fruit and Jelly Presses—
See Presses, Fruit and Jelly.
Fruit Pickers—
See Pickers, Fruit.
Fry Pans—See Pans, Fry.

Funnels—
Gerhardt's Perfection, Standard and
Globe; 7 1/2" gro., 10¢; 2 to 5 gro.,
20¢; 5 to 10 gro., 30¢
Copper, 1 to 6 doz., 15¢; 6 to 12
doz., 20¢; over 12 doz.....25%

Furnaces, Soldering—
Burgess Nos. 3, 4 and 5 Gem, Copper
Reservoir.....\$8.50
Burgess Nos. 3, 4 and 5 Gem tin reaser-
ver.....\$8.50
Clayton & Lambert No. 1 Fire-Pot.....\$12.00
\$6.00; No. 2 Fire-Pot.....\$12.00
Fuse—Dis. 10¢ to 25¢ cash. # 1 1000 ft.
Common Cotton Fuse, for dry grnd., \$3.00
Common Hemp Fuse, for dry grnd., 2.80
Double Taped Fuse, for very wet gr., 5.60
Single Taped Fuse, for wet grnd., 4.75
Triple Taped Fuse, for very wet gr., 6.40
Large Gutta Percha Fuse, for water, 15.00
Small Gutta Percha Fuse, for water, 10.00

Gates Molasses—
Bos, # doz.:
No. 1, \$7; No. 2, \$8; No. 3, \$9; No. 4,
\$10.....60¢ to 60¢ 10%
Lincoln's Pattern.....70¢ to 70¢ 10%
Stebbin's Genuine.....60¢ to 60¢ 10%
Stebbin's Pattern.....80¢ to 80¢ 10%
Stebbin's Tinned Ends.....40¢ to 10%
Weed's.....20¢ to 10%

Gauges—
Barrett's Comb. Roller Gauge.....# doz \$7.50 to \$8.00
Hoague & Peck's Champion Gauge.....
With Scale.....# doz. \$5.00
Without Scale.....# doz. \$5.00
Marking, Mortise, &c.....60¢ to 10%
Stanley R. & L. Co.'s Butt and Rabbit
Gauge.....25¢ to 10%
Starrett's Surface, Center and Sorotch.....25¢ to 10%
Wire, Brown & Sharpe's.....10¢ to 20%
Wire, Morse's.....10¢ to 20%
Wire, P. S. & W. Co.....10¢ to 10%
Wire, Wheeler, Madden & Co.....10%

Gimlets—
Nail and Spike.....60¢ to 60¢ 5¢
Diamond Gimlets.....# gr \$4.50
Eureka Gimlets.....60¢ to 60¢ 10%
Double Cut, Double.....40¢ to 40%
Doub e Cut, Ives.....60¢ to 60¢ 10%
Double Cut, Shepardson's.....45¢ to 45¢ 10%
Glue—
Dodd's Liquid Glue.....25¢ to 25¢ 5¢
Improved Process.....25¢ to 25¢ 5¢
Le Page's Liquid.....25¢ to 25¢ 5¢
Union Liquid.....35%
Glue Pots—See Pots, Glue.

Grease, Axle—
Axle, tin boxes.....# gross \$12.00
Dixon's Everlasting.....10-m pails, ea. 85¢
Dixon's Everlasting, in bxs., # doz 1
\$1.20; 2 doz \$2.00
English Coach, 5-m tin pails, # doz, \$3.50
English Coach, wooden boxes.....# doz \$3.50
Fraser's, kegs, half bbls, or bbl., # 3 1/2¢
Fraser's, tubs.....# 1, 4¢; pails, 5¢
Fraser's, small wood boxes.....# gro. \$9.50
Fraser's 5 m wood boxes.....per doz. \$3.25
Lower grades, special brands.....# gr \$5.50 to \$7.00
Tiger, 5-m tin pails.....# gr \$5.50 to \$7.00
Tiger, wooden boxes.....# gross \$7.00

Grindstones—
Family, regular list.....60%
Family, Cleveland Stone Co.....20%
Grindstone Fixtures—
See Fixtures, Grindstone.
Gun Powder—See Powder.

Hack Saws—See Saws.
Hacks Awi—
Pex, 1/2", Leather Top, # doz.....45¢ to 50¢
Pex, Pat. Plain Top, # doz.....40¢ to 40%
Sewing, Bros' Fer., # gr.....\$1.75
Sewing, P. & Long.....# doz \$1.20
Sewing, Pat., Short, # doz.....45¢ to 50%

Extra 60¢ to 10% given.

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Pullers Nail-

Bolts, 1/2 doz., \$24.00, 40%
 Economy, 1/2 doz., \$5.50 to \$6.00
 Giant, No. 1, 1/2 doz., \$18.00, 10%
 Giant, No. 2, 1/2 doz., \$15.00, 10%
 Pelican, 1/2 doz., \$9.00, 25%
 Moranton, 1/2 doz., \$18.00, 30% to 35%
 10%

Pulleys-

Brass Screw, 70%
 Hay Fork, "Anti-Friction," 5 in. solid, \$6.70
 Hay Fork, "F" Common and Patent, 20%
 Hay Fork, Moore's Anti-Friction 5 in. Wheel, 1/2 doz., \$12.00, 40%
 Hay Fork, Reed's Self-Lubricating, 60%
 Hay Fork, Solid Eye, 50% to 100%
 Hay Fork, Stearns' Nos. 35 & 45, 50% to 100%
 Hay Fork, Stearns' Nos. 15, 25, 66, 68, 60%
 Hay Fork, Tarbox Pat. Iron, 20%
 Hot House, Awning, 60% to 70%
 Japanned Clothes Line, 60% to 100%
 Japanned Screw, 70% to 100%
 Japanned Side, 70% to 100%
 Moore's Ceiling or End, Anti-Friction, 40%
 Moore's Dumb Waiter, Anti-Friction, 40%
 Moore's Electric Light, 38%
 Moore's Side, Anti-Friction, 60%
 Sash (Auger Mortise), 60%
 Common Sense, 60%
 Empire, 60%
 Ideal, Nos. 2, 4, 10 & 15, 40% less 1st 1/2 doz net.
 Star, 20%
 Ideal, or IXL No. 60, 1/2 doz, 22% net.
 On bbl. lots extra 5%.

Shade Rack,

Shepard's Niagara, No. 25, 1/2 doz 23% net
 Tackle Blocks—See Blocks.

Pumps-

Olstern, Best Makers, 60% to 100%
 Pitcher Spout, Best Makers, 70% to 100%
 Pitcher Spout, Cheaper G'ds., 75% to 100%
 Myers' Pumps, low list, 60%

Punches-

Avery's Keying, 40%
 Avery's Sawset and Punch—See Sawsets
 Bemis & Call Co.'s Cast Steel Drive, 50% to 55%
 Bemis & Call Co.'s Check, 55%
 Bemis & Call Co.'s Spring, 60% to 65%
 Bemis & Call Co.'s Springfield Socket, 65%
 Niagara Hollow Punches, 20%
 Niagara Solid Punches, 20%
 Rice Hand Punches, 15%
 Raddler's or Drive, good, 1/2 doz., 60% to 65%
 Spring, good quality, 1/2 doz., \$2.50 to \$3.00
 Spring, Leach's Pat., 15%
 Solid Timbers, P., S. & W. Co., 1/2 doz., \$1.44
 Timbers' Hollow Punches, P., S. & W. Co., 20% to 25%

Rail-

Barn Door, Light, In. 1/4 1/2 3/4
 Per 100 feet, \$1.75 2.10 2.75
 B. D. for N. E. Hand, Small, Med. Large.

Per 100 feet, \$2.00 2.50 3.00 Net
 Carrier, double braced, Steel Rail, 1/2 foot
 Lundy Parlor Door, Planed Edge, 3/4 ft.
 Moody Steel Rail, 1/2 ft., 45% to 50%
 Moore's Steel Rail, 1/2 ft., 45% to 50%
 Sliding Door, Bronze Wrt. Iron, 1/2 ft., 3/4 ft.
 Sliding Door, Iron, Painted, 1/2 ft., 3/4 ft.
 Sliding Door, Wrt. Brass, 1/2 ft., 3/4 ft., 40% to 45%
 Terry's Steel Rail, 1/2 ft., 45% to 50%
 Victor Track Rail, 1/2 ft., 45% to 50%

Rakes-

Cast Steel, Association's, 70% to 75%
 Cast Steel, Odeger's, 70% to 75%
 Malleable, good, 70% to 75%
 Malleable, low grade, 75%
 Fort Madison Prize Bow Brace and Peerless, 65%
 Fort Madison Steel Tooth Lawn Rake, \$6.00
 Gibbs' Awning, 1/2 doz., \$2.50
 Gibbs' Awning, 1/2 doz., \$2.50
 Gibbs' Canton Lawn Rake, 1/2 doz., \$3.75
 Gibbs' Crown Lawn Rake, No. 1, 1/2 doz., \$4.00
 Gibbs' Favorite Lawn Rake, 1/2 doz., \$3.90
 Gibbs' Hustler, No. 0, 1/2 doz., \$4.25
 Gibbs' Hustler, No. 1, 1/2 doz., \$4.40
 Onida Lawn Rake, 1/2 doz., \$6.00

Razors-

Campbell Cutlery Co., 50%
 Electric Cutlery Co., Net prices
 Galvanic, 1/2 doz., \$15.00
 Jordan's AAA1, new list, Net prices
 Jordan's Old Fashioned, new list, Net prices
 J. R. Torrey & Co., Net prices
 Wostenholm and Butcher, 10 to 20%
 10%

Razor Strops-

See Razors, Razor.

Reels-

Stearns', 33% to 100%

Fishing-

Hendryx Aluminum, German Silver, Gold Bronze, Silver Rubber, Popolo and Salmon, Single Action, Multiplying and Quadruple, all sizes, 100%
 Hendryx Single Action Series, 100%
 Hendryx 202P and PN, 102PR and PRN, 202PR and PRN, 504P and PN, 00304P and PN, 502 and 502N, 802 and 82N, 02084N, Competitor, 50%
 Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2804N, 2004P and PN, 002904PN, 0024 and 0024N, 5000N and PN, 40% to 100%

Registers-

Moore's Bronze Finishes, 70%
 Moore's Electroplated, 75%
 Moore's Japanned, 75%
 Moore's Solid Bronze, 65%
 Moore's Stove Pipe, 35%

Rings and Ringers-

Bull Rings

Ulrich Edw. Co., White Metal, low list, 50% to 100%
 Hotchkiss' low list, 30%
 Humason, Beckley & Co.'s, 70% to 100%
 Peck, Stow & W. Co.'s, 50% to 100%
 Sargent's, 75% to 100%
 Union Nut Co., 55%

Hog Rings and Ringers-

Note.—The market on Hog Rings and Ringers is in a demoralized condition and prices are low and irregular. We therefore withdraw quotations for the present.

Rivets and Burrs-

Copper
 Coppered Iron, Betina Brand, 60% to 80%
 Iron Norway, list Nov. 17 '87, 60% to 80%
 Second Quality, 70% to 75%

Rivet Sets—See Sets.**Roasting and Baking****Pans—See Pans, Roasting and Baking.****Rods-**

Stair, Black Walnut, 1/2 doz 40%
 Stair, Brass, 25% to 30%

Rollers-

Acme Moore's Anti-Friction, 55%
 Barn Door, Sargent's list, 60% to 100%
 Moore's Barn Door Stay, 50%
 Union Barn Door Roller, 70%
 Thompson Mfg. Co.'s Lawn Rollers, 30%

Rope—The following prices are f.o.b., New York or factory, and are shaded 1/4% on large lots; terms, 1 1/2% for cash.

Manila, 7-16 in. diam. and larger, 74% to 75%
 Manila, 3/4 in. and 5-16 in. diam., 74% to 75%
 Manila, Tarred Rope, 74% to 75%
 Manila, Hay Rope, Med'm, 74% to 75%
 Sisal, 7-16 in. and larger, 64% to 65%
 Sisal, 3/4 in. and 5-16 in. diam., 64% to 65%
 Sisal, Hay Rope, 64% to 65%
 Sisal, Tarred Rope, 64% to 65%
 Sisal, Medium Lath Yarn, 44% to 45%
 New Zealand, 7-16 in. and larger, 54% to 55%
 New Zealand, 3/4 in. and 5-16 in. diam., 54% to 55%
 New Zealand, Hay Rope, 54% to 55%
 New Zealand, Tarred Rope, 54% to 55%
 Jute Rope, 12 to 15%
 Wire—
 List February, 1892, All kinds, 50%

Rules-

Boxwood, 80% to 100%
 Ivory, 50% to 100%
 Starrett's Steel Rules and Straight Edges, 25% to 100%

Sad Irons—See Irons, Sad.**Sand and Emery Paper****and Cloth—****See Paper and Cloth.****Sash Cord—See Cord, Sash.****Sash Locks—See Locks, Sash.****Sash Weights—****See Weights, Sash.****Sausage Stuffers or Fill-****ers—See Stuffers or Fillers.****Saws—****Note.—Extra 5% to 10% often given.**

Atkins' Circular, 50% to 100%
 Atkins' Cross Cut, new list, 50% to 100%
 Atkins' Mulay Mill and Drag, 50% to 100%
 Atkins' One-Man Saw, 40%
 Atkins' Wood Saws, 40%
 Diston's Circular, 45% to 45%
 Diston's Cross Cut, list Jan. 1, 93, 40% to 100%
 Diston's Hand, 25%
 C. E. Jennings & Co., 25%
 Peace Circular and Mill, 45% to 45%
 Peace Cross Cuts, list Jan. 1, '93, 45% to 100%
 Peace Hand, Panel and Rip, 25% to 25%
 Richardson's Circular and Mill, 45% to 45%
 Richardson's X Cuts, list Jan. 1, 93, 45% to 100%
 Richardson's Hand, 25%
 Simonds' Circular Saws, 45% to 45%
 Simonds' Crescent Ground Cross Cut Saws, 30%
 Simonds' Gang, Mill, Mulay and Drag Saws, 45% to 45%
 Wheeler, Madden & Clemson Mfg. Co., Cross Cuts, list Jan. 1, 1893, 45% to 100%
 Hand, Panel and Rip, 30% to 100%
 Woodrough & McFarlin, Cross Cuts, list Jan. 1, 1893, 45% to 100%
 Hand, Panel and Rip, 25% to 100%

Hack Saws—

Eureka and Crescent, 25%
 Griffin's, complete, 40% to 100%
 Griffin's Hack Saw Blades, 40% to 100%
 Star Hack Saws and Blades, 25%

Scroll-**Barnes' Builders' and Cab Makers' \$15.25****Barnes' Scroll Saw Blades, 35%****Lester, complete, \$10.00, 25%****Rogers, complete, \$4.00, 25%****Saw Frames—****See Frames, Saw.****Saw Sets—See Sets, Saw.****Saw Tools—See Tools, Saw.****Scale Beams—****See Beams, Scale.****Scales—**

Chatillon's Eureka, 25%
 Chatillon's Favorite, 40%
 Chatillon's Grocers' Trip Scales, 50%
 Family, Turnbills, 30% to 100%
 Hatch, Counter, No. 171, good quality, 1/2 doz \$17.00 to \$18.00
 Hatch, Tea, No. 161, 1/2 doz \$3.00 to \$3.50
 Hebble Bros' Platform, 40% to 100%
 Union Platform Plain, \$2.00 to \$2.10
 Union Platform, Striped, \$2.15 to \$2.25

Scissors, Fluting-**Scrapers—****Adjustable Box Scraper (S. R. & L. Co.), \$6.00, 40% to 100%****Box, 1 Handle, 1/2 doz \$2.00****Box, 2 Handle, 1/2 doz \$3.00 to \$4.00****Refuge Box and ship, 20% to 25%****Ship, Common, 1/2 doz \$3.50****Ship, R. I. Tool Co., 10%****Screen Window and Door****Frames—See Frames****Screw Drivers—****See Drivers, Screw.****Screws—****Bench and Hand—**

Bench, Iron, 55% to 100%
 Bench, Wood, Hickory, 20% to 25%
 Hand, Wood, 25% to 100%
 Hand, Grand Rapids, list, 35%

Coach, Lag and Hand-Rail—

Lag, Blunt Point, list Jan. 1, 1890, 80% to 100%
 Coach and Lag, Gimlet Point, list Jan. 1, 1890, 80% to 100%
 Hand Rail, Am. Screw Co., 75%
 Hand Rail, H. & B. Mfg. Co., 70% to 100%
 Hand Rail, Sargent's, 70% to 100%

Jack Screws—

Millers Falls, 60% to 100%
 Millers Falls, Koller, 50% to 100%
 P. S. & W., 35%
 Sargent, 70%
 Stearns', 40% to 100%

Cork—

Detroit Cork Screw Co., 33%
 Humason & Beckley Mfg. Co., 40% to 100%
 Williamson's, 33% to 35%
 Williamson's Forged Worm, Apple wood Handle, 1/2 doz., \$5.00; Rose wood, \$5.50, 40%

Machine—

Flat Head Iron, 70%
 Round Head Iron, 65%

Wood—

List January 1, 1891, 80%
 Round Head Iron, 75%
 Flat Head Brass, 80%
 Round Head Brass, 75%
 Flat Head Bronze, 80%
 Round Head Bronze, 75%
 Rogers' Drive Screws, 82%
 Extra 10% often given.

Scroll Saws—See Saws, Scroll.**Scythes—**

Grass, 40% to 40%
 Grass, 40% to 50%

Scythe Snaths—**See Snaths, Scythe.****Sets—****Awl and Tool—**

Alken's Sets, Awls and Tools, No. 20, 1/2 doz \$10.00, 60% to 65%
 Common Brad Sets, No. 42, \$10.50, \$12.50, 70% to 100%
 Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$8; 5, \$7, 50%
 Henry's Combination Haft., 1/2 doz \$8.50
 Millers Falls Adj. Tool Hds., No. 1, \$12; No. 2, \$18; No. 3, \$18, 25%
 Stanley's Excelsior, No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50, 80% to 100%

Nail—

Round, 1/2 gr. \$3.25
 Square, 1/2 gr. \$4.00 to \$4.25
 Buck Bros., 27%
 Cannon's Diamond Point, 1/2 gr. \$12, 20%

Rivet—

Regular list, 70%

Saw—

Atkins' Criterion, 1/2 doz No. 1, \$8.00
 Atkin's Genuine, \$13.00, 50% to 100%
 Atkin's Imitation, 1/2 doz \$3.00 to \$3.25
 Avery's Saw Set and Punch, 1/2 doz No. 1, \$8.00
 Bemis & Call Co.'s Cross Cut, 30% to 35%
 Bemis & Call Co.'s Plate, 20%
 Bemis & Call Spring Hammer, 30% to 35%
 Common Lever, 1/2 doz \$2.00, 45% to 50%
 Crescent, 1/2 doz \$3.00
 Crescent (Keller), No. 1, \$15.00; No. 2, \$24.00, 40% to 100%
 Diston's Star, 25%
 Hammer, Bemis & Call Co.'s new Pat. 45%
 Hammer, Hotchkiss, \$5.50, 10%
 Hart's Pat. Lever, 1/2 doz \$12.00
 Kohler's Giant Royal, 1/2 doz \$7.00
 Kohler's Royal, 1/2 doz \$7.00
 Leach's No. 0, \$8.00; No. 1, \$15.00; No. 2, \$20.00, 40% to 100%
 Leopold, 40% to 100%
 Lloyd's Acme, 1/2 doz \$15, 40% to 100%
 Morrill's No. 1, \$15.00, 40% to 100%
 No. 3 and 4, Cross Cut, \$23.00, 40% to 100%
 No. 5, Mill, \$81.00, 40% to 100%
 No. 10, \$15.00, 40% to 100%
 No. 11, \$18.00, 40% to 100%
 Nash's, 20% to 100%
 Stillman's Genuine, 1/2 doz \$5.00 to \$7.00, 40% to 100%
 Stillman's Pattern, Hand, 1/2 doz \$3.25
 Cross Cut, \$9.50, 45% to 55%
 Taintor Positive, 1/2 doz \$18, 50%

Sharpeners, Knife—

Parkin's, 1/2 doz \$6.00, 50%
 Greenwood Handles, 1/2 doz \$6.00, 50%
 Tanite Mills, 1/2 gr. \$11.40, 25% to 33%

Shaves, Spoke—

Iron, 45%
 Wood, 30%
 Bailey's (Stanley R. & L. Co.), 50% to 100%
 Cincinnati, 25% to 100%
 Goodell's, 1/2 doz \$9.00, 25%
 Stearns', 40% to 100%

Shears—

Acme Cast Shears, 10% to 100%
 American (Cast) Iron, 60% to 100%
 Barnard's Lamp Trimmers, 1/2 doz \$3.75
 Barnard, Solid Steel Blade, Jap'd, 75%
 Barnard, Solid Steel Blade, Nickle'd, 65%
 Cast Steel Trimmers

First quality, 80% to 100% to 100%**Second quality, 40% to 100% to 5%****Campbell Cutlery Co., Jap'd, 75%****Nickel Plated, 65%****Claus brand, Japanned, 70%****Claus brand, Nickle'd, same list, 80%****Clipper, 10% to 100% to 100%****Davenport Cutlery Co., 60% to 100%****Galvanic 3/4 to 9 in., 10% to 100%****Diamond 3/4 to 9 in., 10% to 100%****Hatch Cutlery Co. Solid Steel Forged, 60% to 100%****Heinrich's, List Dec. 1891, 60% to 100% to 100%****Heinrich's Tailor's Shears, 33% to 40%****Howe Bros. & Hulbert, Solid Forged Steel, 40%****Seymour's, List Dec. 1891, 60% to 100% to 100%****Victor Cast Shears, 75% to 100% to 100%****Timbers' Snips—**

Cast Handle, Mild with Steel, 40%
 Niagara Snips and Shears, 30% to 100%
 Wrt. Handles, Steel Blades, 1/2 (120 to 100)

Pruning Shears and Hooks

Disston's Combined Pruning Hook and Saw, 1/2 doz \$18.00, 20% to 25%
 Disston's Pruning Hook, 1/2 doz \$12.00, 20% to 25%
 Dunlap's Saw and Chisel, 1/2 doz \$5.00, 30%
 Henry's Pruning Shears, 1/2 doz \$4.00, 20% to 25%

Henry's Tree Pruner, 60% to 70%

E. S. Lee & Co.'s Pruning Tools, 60% to 100%
 Levin Pruner No. 1, \$15.00, 40% to 45%
 Levin Pruner No. 2, \$21.00, 40% to 45%
 J. Mallinson & Co., No. 1, \$3.25; No. 2, \$7.25
 Pruning Shears, Henry's Pat., 1/2 doz, \$3.00 to \$3.25

Pruning Shears, Conn. Pat., \$2.50 to \$3.00
 P., S. & W. Co., 60%

Wheeler, M. & C. Co., Combination, 1/2 doz \$12.00

Timbers' & Co.—

Shears and Snips (P. S. & W.), 20% to 25%
 Snips, J. Mallinson & Co., 33% to 35%

Sheaves—**Sliding Door—**

Corbin's list, 60% to 100%
 M. W. Co., list July, 1888, 50% to 100%
 Moore's Anti-Friction, 50%
 Patent Roller, 60% to 100%
 Patent Roller, Hatfield's, 75%
 R. & E., list Dec. 18, 1885, 55% to 60%
 Russell's Anti-Friction, list Dec. 18, 1885, 60% to 65%

Sliding Shutter

Reading list, 60% to 100%
 R. & E., list Dec. 18, 1885, 60% to 100%
 Sargent's list, 70%

Flax Twine—	BO.	B.
No. 9, 1/4 and 1/2 D Balls.....	22 1/2	22 1/2

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Whips

American Whip Co., Length.	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8 ft.
X. L. Whalebone Driving.....	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.....	.....	.....	15.00	16.50	18.00	20.00	.....	.....
Bull Bone, Half-length Whalebone.....	.....	.....	11.00	12.00	13.00	15.00	.....	.....
American Standard.....	8.00	8.50	9.50	10.50	12.00	13.00	15.00	16.50
True Grip, Raw Hide Center.....	6.00	6.00	6.50	7.00	7.50	9.00	.....	.....
New Name, Stocked Java, Black and Wine Colors.....	.....	.....	6.00	.....	.....	.....	.....	.....
Americans, 93 Pen Whip.....	.....	.....	6.00	.....	.....	.....	.....	.....
Gents' Light Driving No. 111.....	.....	.....	6.00	.....	.....	.....	.....	.....
Gents' Light Driving No. 106.....	.....	.....	5.00	.....	.....	.....	.....	.....
Hand-made Stocked Java No. 103.....	.....	.....	3.75	4.00	.....	.....	.....	.....
A large variety of cheaper grades.....	.....	.....	.....	.....	.....	.....	50¢@83.00	.....
Team Whips.....	.....	.....	.....	.....	.....	.....	\$2.00@27.50	.....
Toy Whips.....	.....	.....	.....	.....	.....	.....	.....	gro. \$2.50@13.00
Hardware Assortment, 10/American, 75 Whips for \$50.00.	.....	.....	.....	.....	.....	.....	.....	.....

Wire and Wire Goods—

Iron—

Market,

Br. & Ann. Nos. 0 to 18.....	75¢@105¢	Extra 5¢@10¢
Galv. Nos. 0 to 18.....	70¢@70¢	often given
Tin'd, Tin'd list, Nos. 0 to 18.....	70¢@70¢	prices often made on large lots.

Stone.

Br. and Ann'd, Nos. 16 to 18.....	80¢	Extra 10¢
Nos. 19 to 26.....	80¢@85¢	often given.
Nos. 27 to 36.....	82¢@85¢	.....
Ann. Wire on Spools.....	60¢	.....
Brass, list Jan. 18, 1894.....	40¢@50¢	.....
Cast Steel Wire.....	50¢	.....
Copper, list Jan. 18, 1894.....	40¢@50¢	.....
Galvanized Fence.....	75¢@105¢	.....
Malin's An'ated & Tin'd on Spools.....	60¢@50¢	.....
Malin's Brass and Cop. on Spools.....	50¢@50¢	.....

Steel Music Wire, 12 to 30, imported..... 60¢@70¢
 Stubbs' Steel Wire..... \$6.00 to 2.30¢
 Tate's Spooled, Tin'd & Annealed..... 60¢@50¢
 Tate's Spooled Cop. and Brass..... 50¢
 Tinned Broom Wire, 18 to 21, # D..... 4¢@4¢
 Wire Clothes Line, see Lines.
 Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list..... 90¢@90¢15¢
 Wire Cloth and Netting—
 Galvanized Wire Netting..... 80¢@80¢10¢5¢
 Painted Screen Cloth 100 ft \$1.45@1.50

Wire Barb—

See Trade Report.

Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable.....	40¢
Baxter's Adjustable "S".....	40¢@100¢50¢
Baxter's Diagonal.....	50¢@100¢
Coe's Genuine.....	50¢@100¢
Coe's "Mechanics".....	50¢@100¢3¢
Girard Standard.....	55¢@100¢70¢
Lamson & Sessions' Engineers'.....	60¢@100¢
Lamson & Sessions' Standard.....	70¢@100¢
Girard Agricultural.....	75¢@100¢
Lamson & Sessions' Agricul'.....	80¢@5¢
P. S. & W. Agricultural.....	80¢@5¢
W. & B. Diamond.....	50¢@5¢
Acme, Bright.....	40¢@2¢
Acme, Nickeled.....	40¢@2¢

Alken's Pocket (Bright).....	\$6.00, 50¢@105¢
Alligator.....	50¢
Always Ready.....	25¢@5¢
Benn's & Call's.....	35¢@5¢
Adjustable S.....	30¢@105¢
Brigg's Pattern.....	40¢@105¢
Combination Black.....	40¢@105¢
Combination Bright.....	40¢@105¢
Cylinder or Gas Pipe.....	45¢@5¢
Extra Heavy.....	45¢
Merrick's Pattern.....	55¢
No. 3 Pipe Bright.....	55¢
Bit Wrench, Adj., Tatum's.....	5¢ doz., \$2.25. 25¢@10¢
Cincinnati Brace Wrenches.....	25¢@105¢
Diamond Steel.....	55¢@5¢
Donohue's Engineer.....	20¢@105¢
Eagle.....	50¢@105¢
Hercules.....	70¢@70¢105¢
Taft's Vice Wrench.....	55¢@105¢
The Favorite Pocket.....	5¢ doz., \$4.00, 40¢
Walker's.....	55¢@5¢
Webster's Pat. Combination.....	25¢

Wringers, Clothes—

Am. Wringer Co.'s list, July 1, '93. 2¢ cash
 Colby Wringer Co.'s list, May 1, '94. 2¢ cash
 Lowell Mfg. Co.'s list, July 1, 1894. 2¢ cash
 Peerless Mfg. Co.'s list, Feb. 1892. 2¢ cash
 National Wringer & Mfg. Co., list
 June 1, 1892..... 2¢ cash

Wrought Goods—

Staples, Hooks, &c., list, March 17, 1893
 85¢@105¢@55¢15¢

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils—

Linseed, City, raw.....	52	55
Linseed, City, boiled.....	50	50
Linseed, Western, raw.....	50	50
Lard, City, Extra Winter.....	50	50
Lard, City, Prime.....	50	50
Lard, City, Extra No. 1.....	50	50
Lard, City, No. 1.....	50	50
Lard, Western, prime.....	50	50
Cotton-seed, Crude, prime.....	27	28
Cotton-seed, Crude, off grades.....	25	26
Cotton-seed, Summer Yellow, prime.....	32	33
Cotton-seed, Summer Yellow, off grades.....	30	31
Sperm, Crude.....	63	63
Sperm, Natural Spring.....	63	65
Sperm, Bleached Spring.....	63	70
Sperm, Natural Winter.....	63	70
Sperm, Bleached Winter.....	73	75
Whale, Crude.....	44	44
Whale, Natural Winter.....	44	44
Whale, Bleached Winter.....	47	47
Whale, Extra Bleached.....	43	43
Sea Elephant, Bleached Winter.....	26	26
Menhaden, Crude, Sound.....	25	25
Menhaden, Crude, Southern.....	34	35
Menhaden, Light Pressed.....	34	39
Menhaden, Bleached W'ter.....	40	41
Tallow, City, prime.....	45	47
Tallow, Western, prime.....	43	45
Cocoonut, Ceylon.....	54¢	54¢
Cocoonut, Ceylon.....	64¢	64¢
Cod, Domestic.....	38	40
Cod, Foreign.....	40	43
Red Elaine.....	35	38
Red Saponified.....	44¢	44¢
Bank.....	35	38
Straits.....	58	62
Olive, Italian, bbls.....	58	62
Neatsfoot, prime.....	60	65
Palm, prime, Lagos.....	54¢	54¢

Mineral Oils—

Black, 29 gravity, 25 @ 30 cold test.....	7	7 1/2
Black, 29 gravity, 15 cold test.....	7	8
Black, 29 gravity, summer ..	5 1/2	6 1/2

Cylinder light, filtered.....	12	18
Cylinder, dark, filtered.....	10	13
Paraffine, 23 1/2 @ 24 gravity.....	11	12
Paraffine, 25 gravity.....	10	11
Paraffine, 28 gravity.....	7 1/2	8
Paraffine, red.....	9 1/2	10 1/2

Paints and Colors—

Barytes, Foreign, 10 ton.....	\$22.00	\$24.00
Barytes, Amer. floated.....	29.00	\$32.00
Barytes, Amer. No. 1.....	18.00	\$18.00
Barytes, Amer. No. 2.....	13.00	\$15.00
Barytes, Amer. No. 3.....	11.00	\$12.00
Blue, Celestial.....	6	8
Blue, Chinese.....	40	50
Blue, Prussian.....	25	40
Blue, Ultramarine.....	8	25
Brown, Spanish.....	3 1/2	1
Brown, Vandyke, Amer.....	3	3 1/2
Brown, Vandyke, English.....	6	8
Carmine, No. 40, in bulk.....	2.00	2.00
Carmine, No. 40, in boxes or barrels.....	2.10	2.10
Carmine, No. 40, in ounce bottles.....	1.00	1.00
Chalk, in bulk.....	3	2.00
Chalk, in bbls., 100 lb.....	33	40
China Clay, English.....	10	13.00
Cobalt Oxide, prep'd.....	9.00	\$11.00
Cobalt Oxide, black.....	40	100 lb. 1.90
Cobalt Oxide, black.....	1.96	less 100 lb. 1.96
Green, Paris, in bulk.....	23	23
Green, Paris, 170 @ 175 lb.....	23	23
Green, Paris, small pack.....	25	23 1/2
Rebates.....	2 1/2	2 1/2
over 2 1/2 in 4000 lb. 2¢; 2¢ on 2000 to 4000 lb. 1 1/2¢ on 1000 to 2000 lb. 1¢ on 500 to 1000 lb. purchased during the season.	.....	.....
Green, Chrome, ordinary.....	6	12
Green, Chrome, pure.....	22	25
Lead, Eng. B.B. white.....	7	8
Lead, Ann. White.....	4 1/2	4 1/2
In Oil.....	5 1/2	6 1/2
Lead, White, in oil, 25 lb tin pails, add to keg price.....	..	1 1/2
Lead, White, in oil, 12 1/2 lb tin pails, add to keg price.....	..	1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price.....	..	2 1/2

Lead, Red, bbls. and 1/2 bbls.....	5 1/2	5 1/2
Lead, Red, kegs.....	5 1/2	6
Litharge, kegs.....	5 1/2	5 1/2
Litharge, bbls. and 1/2 bbls.....	5 1/2	5 1/2
Ocher, French Washed.....	1 1/2	2 1/2
Ocher, German Washed.....	1 1/2	3
Ocher, American.....	1 1/2	1 1/2
Orange Mineral, English.....	7 1/2	8
Orange Mineral, French.....	10	10 1/2
Orange Mineral, German.....	7 1/2	8
Orange Mineral, American.....	7 1/2	8
Red, Indian, English.....	5	15
Red, Indian, American.....	2	5
Red, Turkey.....	9	14
Red, Tuscan.....	7	10
Red, Venetian, American.....	100 lb. 70	\$1.00
Red, Venetian, English.....	110	\$1.35
Sienna, Italian, Burnt and Powd'.....	4	5
Sienna, Ital. Burnt Lumps.....	1 1/2	3 1/2
Sienna, Ital. Raw, Powd'.....	4 1/2	5 1/2
Sienna, Ital. Raw, Lumps.....	1 1/2	3 1/2
Sienna, American, Raw.....	1 1/2	1 1/2
Sienna, American, Burnt and Powd'.....	1 1/2	1 1/2
Talc, French.....	1 1/2	1 1/2
Talc, American.....	1	1 1/2
Terra Alba, Fr'ch, 100 lb.....	65	75
Terra Alba, English.....	65	75
Terra Alba, American No. 1.....	65	75
Terra Alba, American No. 2.....	45	60
Umber, Turkey, Burnt and Powd'.....	2 1/2	3 1/2
Umber, Turkey Bnt. Ln.....	2 1/2	3
Umber, Turkey, Raw and Powd'.....	2 1/2	3 1/2
Umber, Turkey, R'w Lumps.....	2 1/2	3 1/2
Umber, Turkey, Bnt. Amer.....	1 1/2	1 1/2
Umber, Turkey, R'w Amer.....	1 1/2	1 1/2
Yellow, Chrome.....	10	25
Vermilion, American Lead.....	11	12
Vermilion, Quicks'g, bulk.....	43	44
Vermilion, Quicks'g, bags.....	44	44
Vermilion, Quicksilver sm'r.....	52	52
Vermilion, English Import.....	55	60
Vermilion, Imitation, Eng.....	8	30
Vermilion, Trieste.....	90	85
Vermilion, Chinese.....	85	\$1.00
Whiting Common, 100 lb.....	40	45
Whiting Gliders.....	50	65
Zinc, American, dry.....	3 1/2	4 1/2
Zinc, French, Red Seal.....	7	7 1/2

Zinc, French, Green Seal.....	8 1/2	9
Zinc, French, V. M. X.....	6	7
Zinc, Antwerp, Red Seal.....	6	6 1/2
Zinc, Antwerp, Green Seal.....	6 1/2	7 1/2
Zinc, German, L. Z. O.....	5	5 1/2
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10 1/2	11
Zinc, V. M. in Poppy Oil, lots less than one ton.....	11	11
Zinc, V. M. in Poppy Oil, lots of 1 ton and over.....	9 1/2	10
lots of less than 1 ton.....	10 1/2	10 1/2
Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1 1/2; 25 bbls., 2 1/2; 50 bbls., 4 1/2. No discount allowed on less than bbl. lots.	.....	.....

Colors in Oil—

Black, Drop, Frankfurt.....	25	30
Black, Drop, English.....	12	15
Black, Drop, Domestic.....	7	10
Black, Lampblack, Best.....	20	35
Black, Lampblack, Common.....	7	13
Black, Ivory.....	8	15
Blue, Chinese.....	35	40
Blue, Prussian.....	20	45
Blue, Ultramarine.....	12	18
Brown, Vandyke.....	7	12
Green, Chrome.....	8	13
Green, Paris.....	18	18 1/2
Sienna, Raw.....	7	14
Sienna, Burnt.....	7	14
Umber, Raw.....	7	10
Umber, Burnt.....	7	10

Putty—

In barrels and 1/2 bbls.....	013¢	013¢
In tubs.....	013¢	013¢
In tin cans.....	013¢	024¢
In bladders.....	013¢	024¢

Spirits Turpentine—

In regular bbls.....	29 1/2	30
In machine bbls.....	30	30 1/2

Glue—

Low Grade.....	7	9
Cabinet.....	11	14
Medium White.....	12	14
Extra White.....	16	20
French.....	10	22
English.....	10	15
Irish.....	10	12 1/2

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